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ADDRESSES AND ORIGINAL ARTICLES

CHRONIC CONSTRICTIVE PERICARDITIS
(PICK'S DISEASE)
TREATED BY PERICARDIAL RESECTION*

By Paul D. White, M.D. Harvard
FROM THE MASSACHUSETTS GENERAL HOSPITAL, BOSTON, MASS.

I BRING to you progress notes of a study of a subject concerning which pioneer but forgotten observations were made by Englishmen years ago, especially by Lower [28] in 1669, by Chevers [9] in 1842, and by Wilks [43] in 1870, but which has received no adequate attention in English medical writings of our own day. This subject concerns congestion that is not due to myocardial failure and in particular that which results from chronic constrictive pericarditis. The teachings of Mackenzie, Lewis, and others of the English school dealing with congestive heart failure have borne rich fruit, but the small though important harvest of the exceptional cases of congestion of other sort has not yet been gathered.

Introduction

Chronic constrictive pericarditis consists of a chronic fibrous or callous thickening of the wall of the pericardial sac which is so contracted that the normal diastolic filling of the heart is prevented. A condition called "inflow stasis" results. There may or may not be calcification of the pericardium, obliteration of the pericardial cavity, or important external pericardial adhesions. There may or may not be an associated accumulation of pericardial fluid in small amount, as in pockets. The parietal pericardium may be preponderantly affected or the epicardium also seriously involved; or both pericardial membranes may be securely or even inseparably united. One section of the pericardium, as over the cardiac apex, may remain relatively free and but slightly thickened, while another part, as over the right auricle and great veins, is markedly contracted; or the entire heart and roots of the great vessels may be encased uniformly in a tightly fitting envelope. There may or may not be an acute or chronic polyserositis, which is, contrary to a common belief, a different thing. There may or may not be frosted liver or spleen. There may or may not be heart disease itself—in my experience the association of chronic constrictive pericarditis, of any important degree at least, with heart disease is very rare; I have encountered only one likely case, and this I believe to be a coincidence.

The signs of chronic constrictive pericarditis are similar in most respects to those of acute constrictive pericarditis, or cardiac tamponade, due to pericardial effusion, and indeed the signs of the former condition may follow the signs of the latter without any interruption at all, or more often after an interval of months or years. The insidious evolution of the disability due to chronic constrictive pericarditis, frequently with no history of a preceding acute pericarditis, makes the diagnosis far more difficult than that of acute constrictive pericarditis that usually develops with striking signs and symptoms in the course of a few hours or days.

In 1896 Pick [30] emphasised the common findings of liver involvement and preponderant ascites, and so the disease has often been called by his name.

The establishment of the diagnosis of chronic constrictive pericarditis has a three-fold importance: (1) it affords the explanation of a group of symptoms and signs in an obscure case; (2) it obviates confusion with other conditions, especially mitral stenosis, cirrhosis of the liver, polyserositis, and nutritional or other rare type of œdema; and (3) expert thoracic surgery may now lead to cure of what was once a hopeless disease.

Historical Résumé

Galen,[18] about A.D. 160, described pericardial effusion in a monkey and scirrhous thickening of the pericardium in a cock and surmised that the same conditions might occur in man and interfere with proper heart function; also he observed post-traumatic septic anterior mediastinitis in a young man on whom he operated successfully, removing some of the diseased sternum, and even the vertex of the pericardium, which he uncovered (the first record of pericardial resection). Although, moreover, the hairy heart had been mentioned now and again in the Middle Ages (and considered a sign of valour), Lower [28] should receive the credit for the first satisfactory account of pericardial disease in man. He may be said also to have initiated the era of recognition of acute and chronic constrictive pericarditis which progressed for about one hundred years. This was in 1669, some years before Bonetus [3] and Vieussens [39] reported cases in 1679 and 1715 respectively. Lower's account is so illuminating that I shall give several quotations from it:—

"Although the fluid enclosed in the pericardium serves effectively for lubricating the surface of the heart and facilitating its movement, it sometimes happens that a profuse effusion oppresses and inundates the heart. This envelope becomes filled in hydrops of the heart; *the walls of the heart are compressed by the fluid settling everywhere so that they cannot dilate sufficiently to receive blood* (italics mine); *then the pulse becomes exceedingly small, until finally it becomes utterly suppressed by the great inundation of fluid*, whence succeed syncope and death itself. . . . Just as the accumulation of too much water in itself brings harm to the heart so it happens that trouble comes when heart and pericardium become everywhere closely adherent; whence, when it becomes attached also to the diaphragm the motion of the heart necessarily mingles and combines with that of the diaphragm. That there must needs be much impediment and inconvenience to both has been shown above and will be still more apparent from the story that follows."

Lower then cites the history of a London housewife, aged 30, who over a period of three years until her death declined steadily in health, with dyspnœa, precordial discomfort, weakness, and a small and intermittent pulse. At post-mortem examination the only important finding was complete pericardial adhesion. Lower states that "this membrane was not, as is proper, thin and transparent, but thick, opaque, *and even callous*."

In 1728 Lancisi [27] made the clinical picture of chronic constrictive pericarditis much clearer by citing the case of a man, aged 24 years, with small pulse and marked swelling of the jugular veins and of the abdomen, who showed at necropsy a small heart with thick completely adherent pericardium.

To complete the first century of the recognition of chronic adhesive pericarditis, Morgagni [29] in 1761 reported seven cases; one of whom, a man 40 years old with a very small pulse, showed a heart "so constricted and confined that it could not receive a proper quantity of blood to pass on." But, he noted

* The St. Cyres Lecture of the National Hospital for Diseases of the Heart, London, July 10th, 1935. The lecture has been divided into two parts, of which the second (to appear in our next issue) contains all the references.

that most of the cases were incommoded little or not at all even shortly before death, as was true of a strenuous fisherman. It was this rather abrupt realisation that there may often be an adherent pericardium without any symptoms or signs therefrom, a point of view emphasised further by Laennec [26] in 1819, that distracted the attention of the medical profession in general from the possible importance of chronic constrictive pericarditis for well over one hundred years; this may be termed the period of neglect. There is little mention of the subject except in passing, if at all, by the leading medical authors of the day, including Corvisart,[12] Kreysig,[24] Laennec,[26] Hope,[22] Williams,[44] Stokes,[36] and Skoda.[35]

Then at the very end of the nineteenth century (Pick,[30] 1896) there began a period of enlightenment which has culminated in (1) the clinical recognition of the disease itself, and (2) the successful application of surgery in a considerable proportion of the cases. During the half century, before Pick's work, four physicians made observations of great importance which for some reason or other almost completely escaped notice. Two of these four were Germans, Griesinger [20] and Kussmaul,[25] and they have been accorded more recognition than their two English predecessors, Chevers [9] and Wilks,[43] who were fully aware of the details of the clinical picture. It is of interest that Wilks in 1870 deplored the lack of interest in the subject to which his reading of Chevers (1842) had attracted his attention; while Kussmaul (1873) demanded recognition of the disease which Griesinger (1854) had observed; yet both Wilks and Kussmaul also apparently spoke to deaf ears.

Under the title "Observations on the Diseases of the Orifice and Valves of the Aorta," Chevers [9] cited as one cause of a narrow condition of the aorta the diminution of the heart that may follow the obliteration of the pericardial cavity. Hope had observed "that he had never examined after death a case of complete adhesion of the pericardium without finding enlargement of the heart, generally hypertrophy with dilatation." Chevers in contradiction wrote:

"With deference to this high authority, I must venture to suggest that the above remarks can be applied only to one class of cases of this description—to those in which, superadded to the adhesion of the pericardium, there is also disease of the valvular passages of the heart; these cases are certainly the most frequent; but I think that a sufficient number of contrary instances have occurred, under my own notice, to prove that, where the valves are healthy, complete and close adhesion of the pericardial surfaces, far from producing hypertrophy and dilatation, has a tendency to be followed by general diminution in the size of the heart and its vessels, and contraction of its cavities."

He noted that in the course of seven years, 1835 to 1842, at Guy's Hospital no case of cardiac enlargement plus chronic obliteration of the pericardial sac failed to show valvular disease or other cause for the enlargement.

His first case report of chronic constrictive pericarditis was that of a girl, 18 years old, admitted to the hospital on June 23rd, 1841, suffering from ascites. About a year and a half previously she had begun to experience difficulty in breathing, and swelling of the legs, and afterwards of the abdomen, which was tapped three times. She died on Sept. 1st and autopsy showed tuberculosis of the right lobe of the cerebellum, miliary tubercles in the lungs, adherent pleuræ, adhesive pericardium, normal heart valves, "nutmeg" liver, congested kidneys, several pints of ascitic fluid, and roughened peritoneum over the liver and spleen, marked by small white depositions. "The cavity of the pericardium was entirely obliterated by a layer of firm and almost cartilaginous deposit, evidently of long standing, and, in some parts, nearly half an inch in thickness. The heart was remarkably small."

Chevers concluded that "the principal cause of dangerous symptoms in cases of the above description appears to arise from the occurrence of gradual contraction in the layer of adhesive matter which has been deposited around the heart, compressing its muscular tissue, and *embarrassing its systolic and diastolic movements, but more particularly the latter.*" (Italics mine.)

In 1870 Wilks [43] wrote: "I do not find, however, in turning to the standard text-books on medicine that mention is made of adherent pericardium, as one of the causes which lead to impairment of the heart's action with the usual accompaniments of venous congestion and dropsy. I may more than others feel surprised at this, since I have known what they may not have been aware of, that the subject had been discussed in the pages of this work thirty years ago." He said that "as a rule the greatest thickening is in front, so as to affect the right auricle and ventricle." The great veins and mediastinum may also be encased. He presented reports of six cases, five males aged 21, 9, 12, 26, and 24 years respectively, and one female aged 16 years.

In 1873 Kussmaul [25] also published an important paper which completed the era of the earliest clinical recognition of this disease. Evidently unaware of the work of Chevers and Wilks, he stated that callous mediastino-pericarditis demanded more attention than was given to it in contrast to the well recognised purulent mediastinal infections and that it had characteristic anatomical and clinical features, especially the involvement of the great vessels, the inspiratory swelling of the neck veins, and the pulsus paradoxus (which he named, but which is better called "marked decrease in pulse amplitude in inspiration—the Griesinger-Kussmaul pulse"—since in slight degree it is a normal phenomenon in the thoracic type of respiration). To his knowledge at that time only one clear-cut case of this condition had been reported, observed by Griesinger [20] in 1854, and described by Widenmann [42] in 1856 under the title "Consideration of the diagnosis of mediastinitis" in a Tübingen inaugural dissertation. The pulse tracing was published by Vierordt [38] in 1855.

With Griesinger's observation in mind Kussmaul in the summer of 1873 made ante mortem the correct diagnosis in two cases of "schwielige (callous) mediastino-pericarditis."

In spite of these four important contributions by Chevers, Griesinger, Wilks, and Kussmaul, and incidental papers by Concato [11] on polyserositis in 1881, by Hutinel [23] on "cardiac and tuberculous cirrhosis of the liver" in childhood in 1894, and by Harris [21] on indurative mediastino-pericarditis in 1895, little interest was shown in chronic constrictive pericarditis until Pick's [30] more familiar contribution at the end of the century. His paper was entitled "Concerning chronic pericarditis running its course under the guise of cirrhosis of the liver (pericarditic pseudo-cirrhosis of the liver) with observations on the frosted liver (Curschmann)." He reported three cases, all males, of 47, 26, and 24 years of age respectively, and discussed in particular the differential diagnosis between chronic pericarditis and primary cirrhosis of the liver.

Pick recognised the fact that the frosting of the liver was not a necessary part of the condition but rather a complication due to chronic peritonitis. Curschmann [13] in 1884 had labelled this condition "perihepatitis chronica hyperplastica (Zuckergussleber or frosted liver)," and described the case of a woman, 54 years old, who died with acute tuberculous peritonitis superimposed on chronic, which was a part of a polyserositis (pleuritis and pericarditis). Here the liver was small and hard and constricted by a dense chronically inflamed capsule 4 to 5 millimetres thick which surrounded the gall-bladder

also. There was no trace of interstitial liver fibrosis or of vascular disease. The heart was apparently normal and not constricted by the adherent pericardium. Thus, this was not a case of Pick's disease. It is of further interest that "frosting" may occur elsewhere than over the liver and spleen, as in a case of frosted intestine without pericarditis reported by Borrmann [4] in 1927.

There are two other important names in the history of the work on chronic constrictive pericarditis before the turn of the century that demand mention, and they are Weill,[41] who in 1895 suggested, and especially Delorme,[14] who from 1895 to 1898 insisted, that relief might be brought to these patients some day by pericardial resection. It was a good many years, however, before this advice was followed.

Türk [37] in 1901 discussed the differential diagnosis of "pericardial concretion" and emphasised three points: first, that along with internal adhesions there may or may not be any important external adhesions with signs thereof, such as systolic retraction of the chest wall; second, that polyserositis or perivisceritis may antedate adhesive pericarditis; and third, that the differentiation from tuberculous peritonitis and from tricuspid and mitral valve disease is more difficult than from true cirrhosis of the liver, in contradistinction to Pick's point of view. He noted that the peritoneum may or may not be involved in these cases. Other workers on pericarditis over this period, like Broadbent and Brauer, were interested primarily not in chronic constrictive pericarditis but rather in external adhesions.

Another interval of time passed and then appeared the two most important recent contributions, namely, the introduction of pericardial resection itself independently by Rehn [31] and by Sauerbruch [32] in 1913, followed by Schmieden [33] in 1918, and the classical paper on the diagnosis of chronic constrictive pericarditis by Volhard [40] in 1923.

Volhard [40] stated that callous thickening and shrinkage of the pericardial sac result in a typical disease picture with effusion in the abdominal and sometimes in the thoracic cavities. That these effusions at times possess an inflammatory character because of attacks of polyserositis can make more difficult the explanation of the disease picture but cannot obscure the predominant influence of the callous pericarditis itself. He said further that the condition was hardly ever recognised, largely, he thought, because reliance was placed on several individual signs which were not pathognomonic. Much more important in his experience was the total picture of the disease with its evolution and "inflow stasis." He wrote that the most important and conclusive indication was the high-grade venous stasis with small heart, overfilling of the neck veins, big liver, and "ascites præcox." He pointed out that in this condition the cardiac difficulty is in the restriction of diastole in contrast to the effect of important external pericardial adhesions which increase the heart load in systole.

In the last ten years there have been a few additional papers worthy of note. In 1926 Fischer [15] amplified Volhard's classical paper on the diagnosis of chronic constrictive pericarditis. He introduced a discussion of the X ray evidence and observed that the heart shadow may be enlarged by the thick pericardium itself, that there may or may not be pericardial calcification, that pericardial calcification may occur without constriction of the heart, and that tuberculosis did not appear to be the ætiological factor in his own series of 8 cases (6 operated on and 2 others autopsied). Fischer also joined Schmieden the same year (1926) in a good review [33] of the subject with anatomical and physiological observations and a discussion of the pathological findings, the diagnosis, and the treatment; they reported 8 operations on 7 cases, one case having had successfully first, a freeing of the anterior surface of the heart over the right chambers, and second, a freeing of the posterior surface over the left chambers.

In 1934 Schur [34] of Vienna wrote an extensive review of the subject with a good bibliography.

He pointed out that cardiac systole as well as diastole is interfered with in Pick's disease but to a lesser degree, that the myocardium may also show some damage in these cases, that there may be a "hydrothorax præcox" as well as an "ascites præcox," that inspiratory swelling of the neck veins is a common and important sign (present in 13 of his 17 cases), that internal pericardial adhesions (concretio cordis) and external pericardial adhesions (accretio cordis) are not commonly isolated, both being present in varying degrees in most cases, that the heart may be enlarged (it was enlarged in 12 of his 17 cases), that auricular fibrillation is not uncommon (in 6 of his 17 cases), that there may be various electrocardiographic anomalies (12 of his 17 cases were studied by electrocardiogram—5 showed pronounced and 2 others showed a slight degree of low voltage), and that several of his cases had a rheumatic ætiology, which is not our experience.

Following the German lead, workers in three centres in the United States have taken a special interest in chronic constrictive pericarditis and have assembled important series of cases with operative cures:—

(1) Beck [1] and his associates in Cleveland, Ohio (14 certain cases of chronic constrictive pericarditis, 10 operated upon, 5 cured, 1 improved); (2) Burwell [7] and his associates in Nashville, Tennessee (10 certain cases of chronic constrictive pericarditis, 7 operated upon, 3 greatly relieved and 2 partially relieved); and (3) Churchill and myself [10] at the Massachusetts General Hospital, Boston (15 proved cases of chronic constrictive pericarditis, 12 operated upon, 6 cured, and 1 seventy-five per cent. relieved).

In other countries than Germany and the United States there has been relatively little interest in the diagnosis and operative treatment of this condition of chronic constrictive pericarditis. The lack of an adequate discussion of the diagnosis in the English language has caused me to present herewith this historical review and a survey of our own cases in Boston with their considerable percentage of operative cures.

Our Own Experience

Until seven years ago there was no special interest in chronic constrictive pericarditis at the Massachusetts General Hospital, though one of our own staff [8] had called attention to Pick's paper and had reported an interesting case. Rarely patients in the clinic were diagnosed as having Pick's disease—I can recall two between 1915 and 1925—but as chronically ill cases they excited no particular interest and there was no relief for them except for repeated abdominal taps. After the case reported by Richard Cabot in 1898 only two others came to autopsy at the hospital in the next thirty years.

On Jan. 24th, 1898, Richard Cabot,[5] then physician to out-patients at the hospital, related the history and post-mortem examination of a boy of 18 who for six years had suffered from an enlarged liver and for four years from ascites. His past history revealed nothing of importance; measles at the age of seven years had been his only illness. Cabot wrote: "Death occurred (8 weeks after entering the hospital in 1893) apparently from pulmonary œdema and exhaustion. The diagnosis at the time of death was entirely uncertain. The absence of any history of alcohol and of any history or lesions of syphilis, congenital or acquired, made cirrhosis of the liver unlikely. There did not appear to be sufficient evidence of cardiac or renal disease to explain the signs. Tubercular peritonitis seemed unlikely in view of the nature of the fluid obtained by tapping and the absence of nodules or

masses in the abdomen after tapping. The sputum was repeatedly examined for tubercle bacilli with negative results. The possibility of a new growth in or near the liver and pressing on the portal radicles or otherwise obstructing the portal circulation could not be excluded, and was considered on the whole the most likely diagnosis.

"*Autopsy* showed the following: Heart of normal size; muscular substance presents nothing abnormal. Pericardium entirely obliterated by firm fibrous adhesions; in the upper part a small, cheesy nodule. Liver greatly enlarged; nutmeg surface on section. Kidneys dark red in colour, with evidence of abundant blood."

In 1925 we were confronted by a new and important patient, a pioneer who for us opened up the rich experience that has followed and who shared with Dr. Churchill the distinction of the first surgical cure of the condition in America.

CASE 1.—Miss C. S., at the age of fifteen years, entered the Massachusetts General Hospital for study on Jan. 26th, 1925. Eight years before she had for two months suffered from smothering spells, fever, a big liver, and fluid in her abdomen. Following this illness she had remained perfectly well for about seven years, that is, until the age of 14, with no cardiovascular signs or symptoms.

In March, 1924, she suffered bilateral peritonsillar infection and "smothering." Her physician again found enlargement of the liver and abdominal fluid, and for the four months before entrance to the hospital she had been in bed. In the past she had had, in addition to the illnesses noted, chicken-pox, whooping-cough, mumps, and influenza (in 1919). She had never had rheumatic fever, chorea, scarlet fever, diphtheria, pleurisy, or pneumonia, and there had been no known exposure to tuberculosis. Her family history was entirely unimportant.

On examination she appeared well developed and nourished, lying flat in bed, in no respiratory distress or pain. The right tonsil was enlarged. The lungs were clear. The heart showed slight enlargement and shifted with change in position. There was no Broadbent's sign. There was a moderately loud systolic murmur at the apex with a third sound. There were no diastolic murmurs. The liver was enlarged, the edge being palpable 6 cm. below the costal margin; it was not pulsating. The blood pressure varied from 130 millimetres mercury systolic and 80 diastolic to 95 systolic and 60 diastolic. The pulse was regular at a rate of 90. During her three weeks in the ward she had one bout of fever, up to 102° F., with a sore throat. Tonsillectomy was carried out on May 4th at the Massachusetts Eye and Ear Infirmary under gas and ether anæsthesia.

X ray examination (Jan. 31st, 1925) showed a definite increase in transverse measurements of the heart shadow, particularly to the left, with well rounded apex, somewhat increased supracardiac shadow, and rather marked increase in prominence of the lung hilus shadows on both sides. The electrocardiogram showed normal rhythm at a rate of 90 with late inversion of the T waves in Lead 1, slight inversion of the T waves in Lead 2, and prominent Q waves with upright T waves in Lead 3. The blood showed very slight anæmia and no leukocytosis. The urine, kidney function, and stools were normal. W.R. negative.

The patient was digitalised without benefit, and discharged on Feb. 17th, 1925, with a diagnosis of "chronic mediastino-pericarditis, chronic tonsillitis, ascites, and perihepatitis."

Because of increase in abdominal fluid and failure to respond to digitalis and diuretin she re-entered the hospital on June 19th, 1925. There were the same findings on examination as before except for an increased amount of ascitic abdominal distension and prominence of the jugular veins. Calomel and novasurol produced slight diuresis only, and finally on July 17th she had an abdominal paracentesis which yielded 4500 c.cm. of clear straw-coloured fluid with a specific gravity of 1·018. On culture this fluid showed no growth and inoculation of a guinea-pig was negative for tuberculosis. She was discharged on July 18th, 1925.

During the next three years she attended the cardiac clinic in the out-patient department regularly, and received digitalis and theocin. The digitalis was discontinued after a while because it in no way affected the ascites. Twice during this interval the abdomen was tapped. She lived a quiet life, unable to resume school.

In 1927 her legs began to swell for the first time, and this symptom increased considerably early in 1928. In April, 1928, she began to have dyspnœa on slight exertion and œdema of the face and upper part of the body; in May, 1928, she had to go to bed, and in June she re-entered the hospital ward following advice that I had given in a pessimistic letter which I had written to her doctor on April 27th, 1928. "She certainly has had a very miserable time and I am afraid there is not much that can be done to help her. There seems little doubt but that pericarditis is at the back of her trouble. Probably she has a good deal of mediastinal involvement and disability of the heart itself. I would suggest resuming digitalis grs. 1½ t.d.s. for a few days and then once daily for a few weeks. If after two or three weeks she is not better I would advise that she come into the hospital again with a thought of considering cardiolysis if there is any chance of freeing the heart. I suppose, however, that the prognosis is poor at best." Dr. E. D. Churchill about this time returned from study abroad which had included observation of pericardial resection in Sauerbruch's clinic. I asked him to see this girl with me, and he agreed to operate. At that time there had been no successful cases in the United States.

The patient and her family consented, and on July 18th, 1928, when she was 18 years old, she submitted to an anterior pericardial resection, which included the removal of a band compressing the inferior vena cava. A very thick pericardium was found constricting the right ventricle and right auricle and great veins. An area the size of the palm of the hand was removed. Microscopically the pericardium that was removed showed a degenerative fibrous connective tissue.

After a moderately stormy two or three days following the operation she began suddenly to improve, and a spontaneous diuresis started on the fifth post-operative day; in the course of a few weeks she lost all her œdema and ascites and her liver decreased considerably in size until the edge could be felt just below the costal border. Her weight dropped from 139½ pounds before the operation to 109 twenty-five days after the operation. Her heart murmur was barely audible.

This patient has been in excellent health and full activity for nearly seven years since her operation (she was last examined on May 16th, 1935). (Figs. 1 and 2.)

The electrocardiogram on April 29th, 1935, showed normal rhythm at a heart-rate of 65, with slightly reduced voltage of the Q R S waves, low T waves in Leads 1 and 2, and slightly inverted T waves in Lead 3; this record shows lower voltage of the Q R S waves than that before the operation, but the T waves are more normal (they were inverted in Leads 1 and 2 in 1928).

With this auspicious beginning seven years ago we have gradually accumulated our experience with 14 more cases of chronic constrictive pericarditis. The account of these patients I have arranged in several groups, beginning with the largest, namely, five others who have been completely cured by operation. Adding these to the first case, we thus have Group A consisting of six patients who illustrate well the features of the cases most amenable to treatment. Then follows one case (Group B) relieved in major part, but not completely cured, by operation. Group C contains three cases who died primarily of the lesion itself; in them the disease was unusually severe and fulminating in its course; in two of these operation probably hastened the end by a few days, while in the third our previous experience warned us of the inoperability of the condition and the patient died without operation. The fourth group (Group D) includes three cases who died of complications, a few days post-operatively in two patients and one year after operation in the third; in two sepsis was responsible (apparently unrelated to the pericardial lesion in one but directly related or superimposed in the

other), and in the third true portal cirrhosis of the liver and posterior pericardial adhesions conspired to cause death. Finally, Group E consists of two living cases, older patients, one with a mild and the other with a moderate degree of constriction, not proved by operation but by characteristic signs and X ray evidence of pericardial calcification.

I shall now describe the other five successful cases.

Group A.—CURED CASES

[CASE 1.—Reported above.]

CASE 2.—Mrs. L. F., housewife aged 30, was sent to me on Jan. 9th, 1933 because of obstinate anasarca. She had always been well and active except for scarlet fever as a child, appendicitis with operation four years before, and a quinsy sore-throat three and one-half years before, at which time she was laid up for four or five weeks. Two and one-half years before my examination she began to have œdema of both feet equally, slight dyspnœa on exertion, and some palpitation, but no pain. These signs and symptoms increased gradually until a year before I saw her when the swelling had involved both legs to the hips, and also the abdominal wall and the belly itself. The dyspnœa had increased somewhat but was never prominent. For a year there had been little change in the condition. She was a semi-invalid, and had puzzled several physicians because of the failure of the dropsy to respond to ordinary remedies such as digitalis, mild diuretics, and rest. Her parents, two brothers, and three sisters were living and well. One brother and one sister had died of tuberculosis. Her one child was in good health.

Physical examination showed a slender woman with much œdema of the legs and moderate prominence of the abdomen. There was a visible pulse in the neck veins in the upright position. Her heart was normal in size; sounds good, no murmurs, but a rather loud third sound at the apex. The heart rhythm was normal and the pulse-rate 84. The blood pressure was 105 mm. systolic and 70 diastolic. The pulse was small. The lungs were clear. The diaphragm was high. The abdominal wall was œdematous and both legs showed marked œdema extending

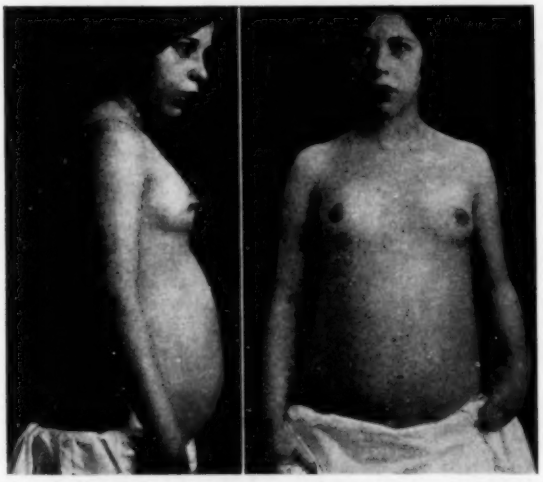

FIG. 1.—(Case 1). The patient, C. S., at the time of her disability from chronic constrictive pericarditis.

up to the hips and waist. X ray examination showed normal size of heart and aorta, with little or no pulsation of the right heart border but active pulsation of the left. The left leaf of the diaphragm was displaced upwards by each heart beat. There was a slight amount of fluid in the right pleural cavity. The electrocardiogram showed normal rhythm, rate 105, with low voltage of the Q R S waves and low T waves in all leads. The T waves in Leads 2 and 3 were slightly diphasic.

She was admitted to the hospital on Feb. 10th, 1933, and her pericardium was resected by Dr. Churchill on April 6th. The pericardium that was removed showed microscopically fibrosis but no tuberculosis. Just before operation the urine, blood, and stools were normal; the Hinton reaction was negative, the basal metabolic rate was plus 5 per cent.,

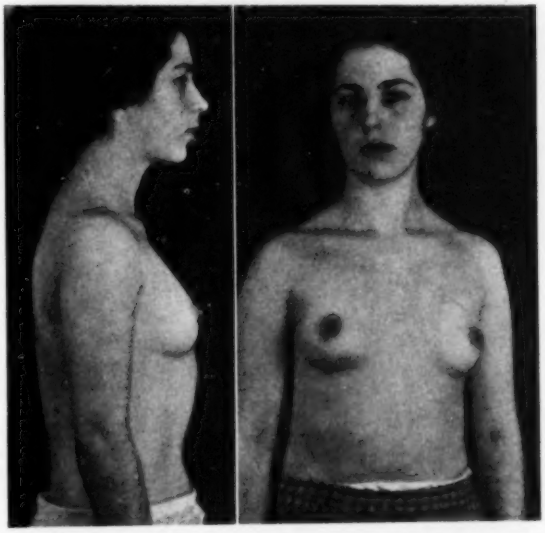

FIG. 2.—Same patient seven years after operation. Her cure, evident in these pictures, was completely effected within a few weeks of the pericardial resection.

and the venous pressure as measured by direct method was 16 cm. The serum protein was reduced to 3·1 per cent. and 4·1 per cent. with albumin 1·5 and globulin 2·6. Following operation the serum protein measured 5 per cent.

After operation she made a rapid recovery with disappearance of symptoms and signs within one month; a spontaneous diuresis began three days after the operation and continued to a loss of 20¼ pounds of œdema fluid. Since her discharge she has been in excellent health in the last two years (examined on May 16th, 1935) and has not only resumed the care of her household but has worked in a mill.

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 100, slight right axis deviation, and slightly inverted T waves in Leads 2 and 3; this differs from the record before the operation in that the T waves in Leads 2 and 3 are inverted, and the voltage is somewhat higher, namely, within normal limits.

CASE 3.—C. A. F., male 19 years of age, entered the Massachusetts General Hospital on Feb. 23rd, 1933. Two years before he had to give up track sport at high school because of increasing dyspnœa. Six months later he began to tire very easily and three months after that, he noticed generalised swelling of his face every morning, swelling of his legs at the end of the day, and increase in the size of his abdomen. He had to rest one day a week, but kept at school otherwise. After leaving school he rested entirely for a month and improved somewhat. A recurrence of signs and symptoms caused consultation with a physiotherapist who declared that his heart was bad, and electrical treatments were advised. He improved slightly, but in the fall, six months before admission to hospital, his dyspnœa and œdema increased, and his weight rose from 156 to 164 pounds. A physician prescribed digitalis and a diuretic, and the weight was reduced temporarily. The obstinacy of the dropsy, however, finally caused his entrance to hospital.

In the past he had had chicken-pox, measles, mumps, whooping-cough, and pleurisy with bronchitis, the last named six months before he began to have shortness of breath. The family history was good, the father, mother and three brothers being alive and well.

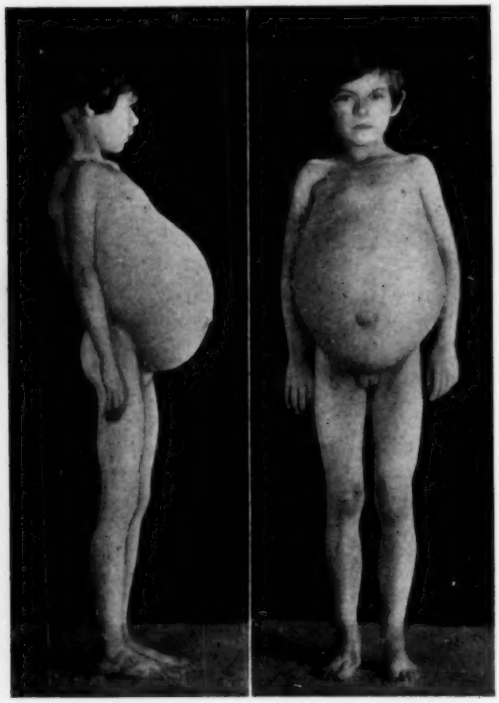

FIG. 3.—(Case 5). B. K., at the time of her disability. Her condition was unchanged for seven years (5 to 12 years of age.)

Physical examination showed a lad in no distress, but with massive pitting œdema of both legs, some œdema of the scrotum, moderate enlargement of the liver, a heart of normal size with distant sounds and no murmurs, a regular pulse of 80, blood pressure of 110 mm. systolic and 60 diastolic, and distension of the neck veins. X ray examination showed normal heart size, thickening of the pleuræ, increase of the supracardiac shadow, and no evidence of pulsation at the right heart border. The lung hilus shadows were slightly increased. The electrocardiogram showed normal rhythm at a rate of 88 with inverted T waves in Leads 1 and 2. Urine and blood were normal. The serum protein was 3·3 per cent., increasing to 4·5 per cent. soon after the operation. The liver function was diminished. The basal metabolic rate was minus 9 per cent.

On April 22nd, 1933, pericardial resection was carried out by Dr. Churchill. A thickened pericardium adherent to the heart was found and removed from the left ventricle, right ventricle, and right auricle. The diaphragmatic pericardium was resected. There was a small pocket of fluid at the diaphragmatic surface. The right auricle in the region of the inferior vena cava was decorticated. On microscopic examination the tissue removed showed fibrosis. There was a slight decrease of œdema on the third post-operative day with the onset of definite diuresis on the sixth day. His œdema and ascites were entirely gone in eighteen days during which time he lost thirty-five pounds of fluid. He has been well in the past two years since the operation (examined May 16th, 1935).

The electrocardiogram taken August 17th, 1934, sixteen months after the operation at which time the patient was well, showed normal rhythm at a heart-rate of 80, with flat T waves in Lead 1, late slight inversion of the T waves in Lead 2 (of the so-called coronary type), and moderate inversion of the T waves in Lead 3; this record shows improvement over that taken before the operation which showed inversion of the T waves in Leads 1 and 2, and lower voltage of the Q R S waves.

CASE 4.—L. C., a lad of 12, entered the Massachusetts General Hospital on June 30th, 1933 with a story of gradually increasing size of his abdomen over a period of three months. He had no other symptoms or signs, and was annoyed at having to interrupt his usual activities to be treated. Four days before admission to this hospital his abdomen had been tapped in another hospital, where calcification of the pericardium had been discovered by X ray.

He had been critically ill with pneumonia at the age of four years, had measles, mumps, and chicken-pox between the ages of four and six years, and a light attack of whooping-cough after that. His tonsils had been removed at the age of two. His father died of tuberculosis (three months before this boy was born). His mother was living and well.

Physical examination showed a well-developed but not well-nourished boy with heart at the upper limit of normal in size, good heart sounds with a loud reduplicated pulmonary second sound, and no murmurs. The blood pressure measured 90 mm. systolic and 60 diastolic. The veins in the neck, arms, and upper chest were dilated. The lungs were clear. The abdomen was somewhat distended (it had been tapped a few days before). The edge of the liver was palpable 6 cm. below the costal margin. There was shifting abdominal dullness but no œdema over the legs or lower back. There was no fever. The blood was normal except for slight secondary anæmia. Urine was normal and stools were normal. The Hinton reaction was negative. The liver function was slightly reduced. The serum protein measured 4·8 per cent. before operation and 6·4 per cent. after operation. X ray examination showed a full-sized heart with increase in the size of the great vessels and enlarged lung hilus shadows, slight thickening of the axillary and apical pleuræ, and a linear area of calcification extending around the entire lower part of the pericardium. The electrocardiogram showed normal rhythm at a rate of 85, with low T waves in Lead 1, diphasic T waves in Lead 2, and inverted T waves in Lead 3.

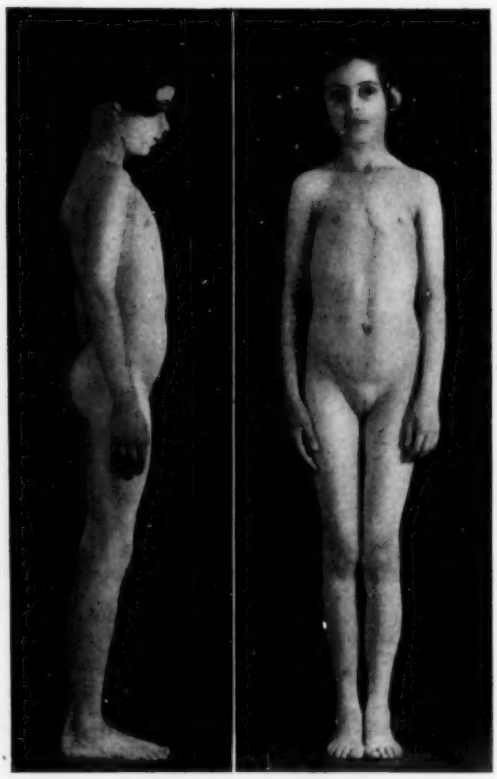

FIG. 4.—Same case one year and a half after operation. Her cure was completely effected within a few months of the pericardial resection.

Pericardial resection was carried out by Dr. Churchill on July 12th, 1933. The fourth, fifth, and sixth costal cartilages were resected as in most of the other cases. A thick hard pericardium with areas of calcification was found and resected from the right ventricle, right auricle, and inferior vena cava. Most of the diaphragmatic pericardium was also resected. The pericardium over the left auricle was not cleared. During the first two post-operative days there were vomiting and acidosis, and then rapid improvement began; spontaneous diuresis appeared on the sixth post-operative day, and continued for twelve days with a loss of eight pounds of fluid, and a shrinking of his girth from 28 to 24½ inches. He has been perfectly well since, during the past two years, and now plays all kinds of games actively, including baseball and football. (Last examination, May 16th, 1935.)

The electrocardiogram, May 16th, 1935, showed normal rhythm at a heart-rate of 70, with normal upright T waves in all leads; this record has now returned to a perfectly normal state in comparison with the record taken before the operation.

CASE 5.—B. K., a girl aged 10, entered the hospital on Oct. 13th, 1931, with a history of having lived a semi-invalid life since the age of 5½ due to a markedly enlarged abdomen resulting from the presence of much ascitic fluid. When she was twenty months old she suffered from what was apparently an attack of acute pericarditis, and her abdomen became enlarged. At the age of 2½ a laparotomy was performed and a gangrenous appendix was removed. No tubercles were seen on the peritoneum at the time of operation. A drain was inserted, and the patient made a good recovery. The fluid returned in about three weeks but following an abdominal tap one month later there was no recurrence of fluid for three years. At the age of 5½ the abdominal fluid returned, and six months later a Talma operation (omentopexy) was done. Abdominal fluid injected into a guinea-pig gave negative results. There was no improvement following this operation, and at the age of 9 the patient entered a second hospital for further study. Her abdomen was tapped at that time, but not again after that until her entrance into the Massachusetts General Hospital in the fall of 1931 when 6240 c.cm. of straw-coloured fluid with a specific gravity of 1·013 were removed.

Her mother had died of tuberculosis during the patient's infancy. Her father is living and well.

Physical examination showed a thin, somewhat pale, young girl with heart apparently normal in size and sounds and without murmurs, and with prominent jugular veins and a large protuberant, non-tender abdomen, filled with fluid. X ray examination showed heart and great vessels somewhat displaced to the right and anchored to the diaphragm; no pulsation was evident at the right border of the heart and great vessel shadow; the right pleura was thickened.

The electrocardiogram showed normal rhythm, rate 100, with inverted T waves in Lead 2.

Advice was given at that time that the chest be explored surgically and the adhesions constricting the right auricle, right ventricle, and great veins be freed.

After an interval of two years this girl returned to the hospital in an unchanged condition with persistence of the enlargement of the abdomen. The serum protein measured 4·3 per cent. X ray and electrocardiographic findings were as before.

Pericardial resection was carried out on Nov. 16th, 1933, and a moderately thickened pericardium containing calcareous plaques was removed from over the right ventricle and right auricle by Dr. Churchill. The pericardial tissue that was removed showed fibrosis and calcification on examination. There was a stormy time for two days after the operation, and during the first two weeks there was no apparent improvement. About four weeks after the operation spontaneous diuresis began and in the course of a few months the ascites completely disappeared. She has been in excellent health since, and looked well when she was last examined by us on May 16th, 1935. (Figs. 3 and 4.)

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 80, with slightly upright T waves in Lead 1, flat T waves in Lead 2, and very slightly inverted T waves in Lead 3; this record differed from that taken before the operation in that the T waves were more normal and the voltage of the Q R S waves was greater.

CASE 6.—D. G., a schoolgirl aged 11, entered the Massachusetts General Hospital on Dec. 31st, 1934, with a history of fatigue and apathy during the previous year, and abdominal swelling for eight months. Two months after the abdominal swelling began heart trouble was diagnosed and medicine, apparently digitalis, was given. The ascites, however, persisted and occasionally puffiness of the eyelids in the morning was noted. She had been in bed most of the time for three months.

On examination she was a well-developed and rather poorly nourished girl, sitting quietly in bed, with no apparent pain or distress. She was very cheerful. The skin and mucous membranes were somewhat pale. The heart was normal in size. The sounds were good, with no murmurs, but a loud third sound at the apex. The pulse-rate was regular at 90. There was very slight elevation of temperature, 99½° to 100° F. rectal. The blood pressure was 98 mm. systolic and 70 diastolic. There was moderate distension with pulsation of the veins in the neck. The venous pressure was 21 cm. in the jugular vein. The lungs were clear. The abdomen was rounded, firm, but not tender, with shifting dullness in the flanks, and a definite fluid wave. The liver edge was palpable 5 to 7 cm. below the costal margin. The spleen was not felt. There was no œdema of the legs. There was a slight "paradoxical" pulse. The Hinton and tuberculin tests were negative. The liver function test was slightly reduced. The blood was normal except for slight secondary anæmia. The urine was normal and the stool was normal. The serum protein was 7·4 per cent. Two litres of straw-coloured fluid were removed from the abdomen by tapping. The specific gravity of this fluid was 1·016. Injected into a guinea-pig it gave no evidence of tuberculosis ten weeks later. X ray examination showed normal heart size and shape with good pulsations. There was no evidence of fixation of the heart or of adhesions. There was some increase in the shadow of the great vessels at the base to the right of the midline, with increase in the lung hilus shadows. The electrocardiogram showed normal rhythm with inverted T waves in Leads 2 and 3.

Pericardial resection was advised, and she was readmitted to hospital later, on Feb. 4th, 1935. Pericardial resection was carried out on Feb. 27th. A thick, but not calcified, pericardium, adherent to the heart throughout, was discovered and resected from the right ventricle and right auricle. Examination of the pericardium which was removed showed fibrosis without evidence of tuberculosis. She went through an uneventful convalescence except for slight right pulmonary collapse. Spontaneous diuresis began mildly on the third day, but she showed very little improvement prior to her discharge on March 30th, 1935. Since that time she has shown steady improvement at home, and to-day is in good health except that she tires easily. Her abdominal swelling has entirely disappeared.

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 120, with slight right axis deviation, slight inversion of the T waves in Lead 2, and moderate inversion of the T waves in Lead 3, much the same as in the record before the operation.

The five cases detailed above were completely cured by operation. The next case, though not so successful, was greatly relieved by operation.

Group B.—GREATLY RELIEVED BY OPERATION

CASE 7.—J. N., aged 16, was referred to us with the diagnosis of chronic constrictive pericarditis. In early childhood he had had chicken-pox and measles; at 5 years of age a tonsillectomy was done. At 9 he had double pneumonia, and was in bed for six weeks. There was a complication of left pleural effusion and this was tapped. Cardiac enlargement and a systolic murmur were discovered then. At the age of 13 routine examination showed some cardiac enlargement with systolic murmur, pulsating veins in the neck, and enlargement of the liver, the edge of which was felt three fingers-breadth below the costal border.

When 14, during the winter of 1929–30, he noticed that his face was swollen and that he had some difficulty in getting on his waistcoat due to enlargement of the abdomen. Œdema of the thighs was developing at that time, and the liver enlarged until its lower edge reached the umbilicus. He continued at school for part time for a year and then had to give up and was living a semi-invalid life when we saw him. He had had very little dyspnœa. Diuretics were used with temporary benefit. Two months before entrance to our hospital his abdomen had been tapped and eight litres of fluid removed. Digitalis had been ineffective. There was nothing abnormal in the family history.

Physical examination showed a well-developed and moderately well-nourished young man, lying comfortably in bed, without dyspnœa, but with slight to moderate engorgement and pulsation in the jugular veins. The pulse-rate was absolutely irregular at a rate of 120, and the pulse was definitely "paradoxical." The blood pressure was 110 mm. systolic and 95 diastolic. The heart showed moderate enlargement. The sounds were of fair quality. There was a loud blowing systolic murmur at the apex; there were no diastolic murmurs. A slight third sound was heard at the apex. The lungs were clear. The abdomen was uniformly prominent. There was slight œdema over the anterior abdominal wall and over the shins. The heart shifted definitely on change in position of the thorax. The liver edge was not tender; it was easily felt, extending across the abdomen half way between the umbilicus and costal border. There were no Broadbent's sign and no clubbing of the fingers or pyrexia. The blood was normal. The urine showed the slightest possible trace of albumin with a rather high specific gravity due to his restriction of fluid intake. X ray examination showed definite enlargement of the heart in all diameters, particularly in the region of the auricles. There was increase in the supracardiac shadow, thought to be due to venous congestion. Barium in the œsophagus showed deviation to the right in the region of the left auricle. Pulsations were weak but definite. The lung hilus shadows were increased, the pleuræ markedly thickened on both sides. Electrocardiogram showed auricular fibrillation at a ventricular rate of 80 with slight right axis deviation, and inverted T waves in Leads 2 and 3.

Pericardial resection was advised, and on Sept. 27th, 1932, this was done by Dr. Churchill. A very much thickened pericardium with some calcium deposit was found and dissected off from the right ventricle and right auricle, and in part from over the left border of the great vessels. A considerable portion of diaphragmatic pericardium extending backward to the region of the inferior vena cava was removed. A considerable amount of calcified pericardium was left, but the amount that was excised allowed the heart to herniate outwards and evidently greatly increased its diastolic filling. Microscopic examination of the pericardium which was removed showed hyaline degeneration of fibrous connective tissue with focal deposits of lime salts.

His post-operative condition was satisfactory but improvement was slow. In the course of the first week the anasarca seemed to be clearing somewhat, and the cervical veins were less engorged. The venous pressure dropped from 28 cm. to 14 cm. After disappointingly slow progress and the use of salyrgan intravenously on several occasions and abdominal paracentesis he returned to his home in Oklahoma where he remained ten months. He returned to us in September, 1933, showing great improvement, but not cured. He had lost about twenty pounds in weight, but still required an occasional abdominal paracentesis. The serum protein was 4·3 per cent. The liver function showed a retention of 10 to 15 per cent. of the dye. His electrocardiogram showed auricular fibrillation with slightly low voltage and slight right axis deviation as before. X ray examination showed some calcification which had not been definitely evident before. It was thought that further pericardial resection was indicated.

On Nov. 16th, 1933, Dr. Churchill operated again with ease through the original scar, which was excised. Calcified pericardium at the base of the great vessels was removed, and the right auricle was more completely freed. The left auricular appendage was dissected free. The pericardial tissue removed showed, as before, fibrosis with calcification. There was an uneventful convalescence after this second operation but no further improvement, and on March 30th, 1934, a Talma operation (omentopexy) was done because of the opinion that the liver condition was now possibly responsible for the persistently recurring ascites. At the time of his operation a small bit of liver was removed, and was found to show only slight "cardiac" fibrosis. The liver capsule was not thickened (no "frosting" or Zuckergussleber).

There has been no distinct improvement following this operation. Frequent abdominal taps were necessary every one to two weeks until a diet very low in both salt and fluid was carried out under careful control during the past spring. On this diet which is somewhat similar to that used by the famous Finsen,[16] who had Pick's disease, there had been no gain in weight and the ascites had been so controlled that an interval of more than six weeks passed from the last paracentesis to the date of my last examination of this patient on May 31st, 1935, at which time he appeared in a fair state of health, quite active, but very dry with considerable weakness (probably from near heat prostration) on hot days—he is unable to perspire because of the marked limitation of fluid and of salt ingested (180 c.cm. of the former and 2·5 g. of the latter each twenty-four hours).

There are various indications that in the case of this young man the remaining disability results from constriction of the left chambers of the heart, especially the auriculoventricular ring, which acts much as mitral stenosis would act. The round shape and moderate cardiac enlargement by X ray examination, the presence of auricular fibrillation with right axis deviation by electrocardiogram, the X ray picture of posterior pericardial calcification, and the knowledge that the anterior surface of the heart is well freed from constricting pericardium are evidence in favour of this point of view. A further operation to clear the pericardial adhesions from the posterior wall of the heart would seem reasonable. Because of his marked improvement in certain respects, however, it has been thought wise, first, to complete a careful study as to the effect of low salt and fluid intake. In Germany a similar case has been successfully operated upon twice,[22] first, with the freeing of the anterior surface of the heart, and second, with the freeing of the posterior surface of the heart. His condition was excellent some years later.

Group C.—CASES WHO DIED PRIMARILY OF THE LESION ITSELF

In two of these (Cases 8 and 9) operation probably hastened the end by a few days; the third (Case 10) died without operation.

CASE 8.—J. M., male aged 36, mechanic, consulted his company physician on Sept. 15th, 1933, complaining of fever, slight cough, and profuse sweating which had come on acutely. His temperature was 101·5° F. The next day he felt a tightness over the lower part of the sternum. X ray examination showed an enlarged heart shadow and a provisional diagnosis of pericardial effusion was made. There was no story of rheumatic fever. He entered the local hospital and remained there three months with an oscillating temperature. A right chest tap brought fluid. He was discharged home from the hospital in December, 1933, where he remained on very restricted activity for six or seven weeks, but then he began to develop abdominal enlargement and œdema of the lower legs. He returned to the hospital on Jan. 18th, 1934. A persistence of his œdema and ascites caused his transfer to the Massachusetts General Hospital for consideration of pericardial resection for constrictive pericarditis. There was no important illness in his past history. His family history was excellent.

Physical examination on Feb. 15th, 1934, showed a very ill man with little dyspnœa but cyanosis of the lips and cold cyanotic extremities. The heart dullness was slightly increased as determined by percussion, and there

was no shift on change of position. There was no visible or palpable cardiac impulse. The heart action was rapid (104), regular, with muffled sounds at the apex. There were no murmurs. The pulses were small, and faded out markedly during inspiration (a high degress of "paradoxical" pulse). The blood pressure was 106 systolic and 90 diastolic. There was evidence of right hydrothorax. The abdomen was enlarged with a considerable amount of fluid, and the liver was enlarged and tender, the edge being felt about half-way between the costal border and the umbilicus. There was no œdema of the legs while in bed. He remained under observation in the hospital from Feb. 15th until April 2nd, when he was transferred to the surgical side for operation. During this interval of six weeks there was slight fever, usually about 100° F. rectal in the evening, rarely reaching 101.° An abdominal paracentesis was done four times; the first time 5728 c.cm. of greenish-yellow fluid were obtained, the second time 5376 c.cm., the third time 1536 c.cm., the fourth time 6144 c.cm. The specific gravity of the fluid ranged from 1·010 to 1·012. The urine showed slight albuminuria. The blood showed slight leukocytosis. The blood-serum protein varied from 7·4 to 4·96. The Hinton reaction was negative. The liver function test showed 4 per cent. of the dye retained. X ray examination showed a heart shadow area somewhat greater than normal, with especial increase in the region of the great vessels, more on the right. The borders of the heart were irregular. The pulsations were weak. There was evidence of some fluid in both pleural cavities. His condition was essentially unchanged during his six weeks in the hospital, and on April 2nd, 1934, an attempt was made to decorticate the heart. The electrocardiogram showed normal rhythm, and low voltage with flat T waves in Lead I. and inverted T waves in Leads II. and III.

An extensively thickened pericardium was exposed overlying the heart which was barely pulsating; a part of it was resected. His condition became critical at the beginning of the operation and he died while still under the influence of the anæsthetic. There was no autopsy.

Examination of the pericardium that was removed showed a thickness of 1 cm. Between the surfaces, on which there were tubercles, there was a large mass of irregular friable soft yellowish fibrinous material.

CASE 9.—J. B., male aged 23, a labourer. Previously in excellent health, he began to notice easy fatiguability and weakness in the summer of 1930. These symptoms were sufficient to cause him to change his work from that of a mover to that of an errand boy. In the fall of 1930 he began to notice generalised œdema, first in his neck (his collars became too tight), then in his waist (his trousers became too tight), and soon all over, including his extremities and face. In November, 1930, he had to stop work entirely because of the generalised swelling and increasing dyspnœa and weakness. Shortly after this he had a head cold, and entered a local hospital. There the swelling largely abated, but on his return home recurred to a high degree and continued until his entrance into the Massachusetts General Hospital for study on Jan. 5th, 1931. Other symptoms were a dry and unproductive cough and hoarseness which had developed in the fortnight before admission.

Physical examination on Jan. 5th showed extensive anasarca involving face, neck, trunk, and legs. There were extensive cyanosis and marked dyspnœa and orthopnœa, with hoarse voice. The throat and tonsils were œdematous. The heart showed slight increase in percussion dullness, both to the right and to the left. The heart sounds were distant and poorly heard. There were no murmurs. There was a high degree of "paradoxical" character to the pulse. The blood pressure was 120 systolic and 100 diastolic. The pulse-rate was 90 to 100, and the rhythm was regular. There was emphysematous breathing, and sibilant râles were heard in both lungs. The abdomen was tense, and there was a marked fluid wave. On six successive days paracentesis was performed, first of the abdomen on Jan. 5th when a small amount of yellow, turbid fluid with a specific gravity of 1·022 was obtained. On Jan. 6th his pericardium was tapped and 105 c.cm. of fluid was withdrawn. There was a slightly turbid character to this fluid, and the specific gravity was 1·024. On Jan. 7th his chest was tapped on the right side, but no fluid was obtained. On Jan. 8th the abdomen was tapped again with the same result as on the 5th. On Jan. 9th the pericardium was tapped again and 95 c.cm. of cloudy yellow fluid were obtained, which later gave a positive test for tubercle bacilli after inoculation in a guinea-pig. On Jan. 10th the abdomen was tapped and 100 c.cm. of cloudy fluid, negative for tuberculosis by guinea-pig test, were removed. Finally, on Jan. 13th the chest was tapped once more and 900 c.cm. of bright yellow fluid were withdrawn. The urine showed no abnormalities. The blood examination was also normal. The sputum showed no tubercle bacilli. The Hinton reaction was negative. The venous blood pressure was 32 c.cm. on Jan. 14th.

Because of the seriousness of his illness and the failure to obtain relief by any medical measures, pericardial resection was decided upon, and on Jan. 14th, 1931, this was done by Dr. Churchill.

When the surface of the pericardium was exposed no pulsation of the heart was evident. The pericardium was much thickened (5 mm.), and when incised there was an escape of about 130 c.cm. of thin straw-coloured fluid under pressure. The inner aspect of the pericardium was covered with tubercles. The heart was small, and in no place in contact with or adherent to the parietal pericardium. An oval window approximately 3 in. in diameter was removed from the anterior surface of the parietal pericardium and a V-shaped line of resection was continued on to the diaphragmatic pericardium. The inflammatory process apparently extended around the roots of the great vessels. The heart did not dilate, either due to persistence of constriction of the venæ cavæ or to thickened epicardium.

The patient died with little or no change in his condition on Jan. 15th. There was no autopsy.

CASE 10.—Mrs. A. G., housewife aged 31, began to be troubled in the summer of 1933, by paroxysms of tachycardia, lasting from one to six hours each, associated with fatigue which had followed the birth of her son five months before. Two months after the paroxysmal tachycardia began she consulted her physician who found no abnormalities except for a slight increase in cardiac percussion dullness and a pericardial friction rub. Shortly after this a slight fever was discovered and she was sent to bed. Two weeks later she developed an unproductive cough. The fever and friction rub persisted, and she was admitted to a hospital near her home, and remained there for three months. Blood culture and Wassermann reactions were negative. There was a slight secondary anæmia. She improved somewhat and was sent home. The pericardial friction rub had finally disappeared after persisting for several weeks.

On Jan. 15th, 1934, she began to be breathless and cyanotic and on examination showed marked jugular engorgement, enlarged liver, and ascites. She was readmitted to the hospital on Feb. 1st, and fluid was found on both pleural cavities which were tapped. The pleural fluid showed a specific gravity of 1·020. The tapping on one occasion was followed by a severe attack of pulmonary œdema. On March 8th peritoneal fluid was withdrawn, showing a specific gravity of 1·020. She was discharged home in April, 1934, after having had a favourable diuresis from the use of salyrgan. During the spring and summer of 1934 she was in a rather poor state of health with gradually increasing weight due to increase in the degree of dropsy. Abdominal paracentesis was carried out twice. Salyrgan was injected once or twice a week with varying response, and Southey tubes were inserted early in October. She had been in bed most of the time with increasing dyspnœa as well as œdema.

She was admitted to the Massachusetts General Hospital on Oct. 18th, 1934, for consideration of pericardial resection. At that time she was quite ill, breathing rapidly and shallowly, with marked distension of the neck veins. The heart was little if at all enlarged, without murmurs, but with an accentuated pulmonary second sound. The rhythm was regular. The pulse was small and markedly "paradoxical." The blood pressure was 95 mm. systolic and 70 diastolic. There was evidence of fluid in both

pleural cavities and there was marked ascites with great enlargement of the liver, the edge of which was felt, slightly tender, midway between the costal border and the umbilicus. There was œdema of the legs and lower back. Her urine showed very slight albumin, but no sugar or bile. The blood showed very slight secondary anæmia and a white count ranging from 9400 to 12,700.

The abdominal fluid gave a specific gravity of 1·012. Guinea-pig inoculation was negative for tuberculosis. The chest fluid was heavily blood-tinged. On one occasion when 2000 c.cm. were removed from the left pleural cavity there was severe collapse with pulmonary œdema.

FIG. 5.--(Case 10). Heart and pericardium, showing very thick callous pericardial sac completely encasing the heart.

X ray examination showed the lower two-thirds of the heart shadow obscured by fluid in the pleural cavities, more on the left than on the right. There was no evidence of cardiac pulsation; the heart area seemed somewhat increased. The electrocardiogram showed sino-auricular tachycardia at a rate of 110 with slight left axis deviation, flat T waves in all leads, and slightly prolonged P–R interval, 0·22 second. An effort was made by paracentesis and the use of salyrgan and other measures to get her into condition for operation, but this effort was unsuccessful, and she died Nov. 15th, 1934.

Autopsy showed a markedly thickened and toughened cartilaginous pericardium, 3 to 5 mm. thick, everywhere closely adherent to the heart. A line of cleavage split off the thicker constricting parietal pericardium, but underneath the heart was still closely encased in fibrous epicardium. (See Fig. 5.) The œsophagus was involved, and the trachea also, in dense fibrous tissue continuous with the pericardium. The bronchial glands were surrounded by tough fibrous tissue. The diaphragm was adherent but not itself involved. The orifices of the great arteries and veins were not constricted. The heart itself was normal, weighing 250 g., without any disease of myocardium, valves, or coronary arteries. The aorta, pulmonary artery, and venæ cavæ were normal. The lungs were nearly collapsed and intensely congested. There was no evidence of pneumonia or tuberculosis. Each pleural cavity contained 1 litre of thin, pale yellow, slightly cloudy fluid. There was no pleuritis of any moment; there were a few thin fibrous threads. The peritoneal cavity contained about 1 litre of slightly turbid fluid, but the peritoneum was not involved. The liver showed some cirrhosis, and weighed 1500 g. The capsule was not thickened. The spleen was normal. The kidneys were congested.

We believe that this case would have been curable had we taken her on a few months earlier.

(To be concluded)

ILFORD MATERNITY HOME.—As many as 95 cases had to be turned away from this home last year because of lack of room. Fees ranged from £5 5*s.* to 10*s.* a week, and 474 women were admitted with only one maternal death.

OBSERVATIONS ON ANÆMIA IN THE CHRONIC RHEUMATIC DISEASES

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THE frequency with which sufferers from chronic rheumatism present the appearance of anæmia is a commonplace with clinical observers. Llewellyn Jones in 1909 [1] reviewed the results of early laboratory observations and expressed surprise that the blood changes found were so inconstant. Twenty years later, Pemberton [2] writes that "the tendency to anæmia is very definite in the 'infectious' varieties of arthritis" and suggests the importance of the condition of the blood in influencing the metabolic processes in the affected extremities. Pemberton also notes [2 3] that improvement in the arthritis, including relief from pain, often coincides with improvement in the hæmoglobin and red cell content of the blood.

Anæmia, as a symptom or as a complication of the rheumatic diseases, is important. I have repeatedly observed that anæmic patients suffer more from their disabilities than those whose blood condition is normal or nearly so. Such patients complain more of pain, general lassitude, and muscular weakness, and successful treatment of the anæmic state, even though it may be merely "symptomatic treatment," is a definite step in the alleviation of their sufferings. Unfortunately the usual methods of therapeutic attack upon secondary or "chlorotic" anæmias frequently fail in these cases. Thus of 12 patients with chronic rheumatism and a severe or moderate anæmia who were given massive doses of iron, and observed for periods up to 21 days, seven totally failed to respond and only two showed any marked improvement.

The efficiency of various therapeutic measures is at the present time being investigated. The purpose of the present paper is to record the results of certain investigations into the frequency and the nature of anæmia in rheumatic subjects, and the factors which influence its development. Kahlmeter [4] mentions that achylia is probably of no importance in the production of this anæmia; this has been reinvestigated in view of the occurrence of achlorhydria in hypochromic anæmia, as shown by Witts [5] and others. Attention has also been paid to the possibility of dietary deficiencies influencing the blood picture.

TECHNIQUE

One hundred and ninety-six in-patients of the Harrogate Royal Bath Hospital formed the subjects of this investigation. Full examination of the blood has been made on 110 patients and gastric analyses in 100 cases. Hæmoglobin has been estimated on a Sahli-Hellige hæmoglobinometer with accurate coloured glass standards; the method is probably as accurate as any other of equal simplicity. The results are recorded, for comparison with other methods, as grammes of hæmoglobin per 100 c.cm. of blood. Blood was taken from the lobe of the ear of patients three hours after a meal and never immediately after measures of physical therapy. Gastric analysis was made by means of the fractional test-meal. The meal of oatmeal was administered after withdrawal of the resting-juice and after washing out the stomach with water.

INCIDENCE OF HÆMOGLOBIN DEFICIENCY

The hæmoglobin content of the blood was determined in 124 patients (62 male and 62 female). No selection of cases was made and these cases con-

stituted the total number of in-patients of the hospital at a certain time. It was hoped that this small number of cases would constitute a fair sample of the rheumatic population, but it differs from the far larger sample dealt with in the Ministry of Health 1924 Report,[6] in that there is a higher proportion of arthritis and especially of atrophic (infective or rheumatoid) arthritis, which constitutes 41·9 per cent. of our cases. The results of this preliminary investigation are shown in Table I. :—

TABLE I

Hæmoglobin Content of the Blood in 124 *Unselected Rheumatic Subjects*

—	Hæmoglobin, grammes per 100 c.cm.							
	16–17	15–16	14–15	13–14	12–13	11–12	10–11	<10
Male	6	4	16	16	16	3	1	–
Female ..	–	3	11	21	17	4	4	2
Total ..	6	7	27	37	33	7	5	2

If we accept 14 g. Hb. per cent. as the lower limit of normality, we find that 58 per cent. of the men and 77·5 per cent. of the women have hæmoglobin below this level, and 6·5 per cent. of the men and 16·2 per cent. of the women have a moderate or severe hæmoglobin deficiency (below 12 g. per cent.). This incidence of hæmoglobin deficiency is rather greater than Pemberton and Peirce [7] found to be the case among 700 army and civilian patients: an occurrence possibly explained by the higher proportion of arthritis and of severe cases in my series.

RED CELL COUNT, COLOUR-INDEX, ETC.

The red cell count in rheumatic patients is much less affected than the hæmoglobin. In no case was a hyperchromic anæmia (colour-index more than unity) encountered, and in only 24 out of 75 females and 2 out of 25 males was the total red cell count below 5,000,000. The colour-index of 100 cases varied between 0·96 and 0·49. Nucleated red cells were not met with, and reticulocytes averaged 0·5 to 1·5 per cent. of the red blood-cells. The fragility of the red corpuscles was found to be normal in six cases so examined.

ANÆMIA AND THE TYPE OF RHEUMATIC DISEASE

In order to determine whether anæmia is commoner in any particular type of chronic rheumatism, 170 cases have been classified (Table II.) according to diagnosis and the hæmoglobin content of the blood. Careful consideration has been given to the diagnosis of each case, and cases of doubtful diagnosis have not been included in this Table. The diagnostic classification adopted is given below; it follows, in the main, the more recent classifications of the American and English schools.

Group A. Atrophic arthritis of unknown ætiology, including (1) typical "rheumatoid" polyarthritis. (2) "Rheumatoid" or "infective" arthritis affecting one or more large joints. (3) Ankylosing spondylitis—Marie-Strümpell type.

Group B. Osteo- (hypertrophic or "degenerative") *arthritis.*

Group C. Non-articular rheumatism, including fibrositis, muscular rheumatism, and sciatica.

Two important points are confirmed in this Table. (*a*) Anæmia is far more common among female than among male patients, six times as many females as males having hæmoglobin below 12 g. per cent. This finding may, of course, be due in part to the lower hæmoglobin content and red cell count of the blood in normal women. (*b*) The severer grades of anæmia occur (with an incidence of pathological significance) only in the atrophic arthritis group.

TABLE II

Hæmoglobin Content of the Blood in 170 *Cases of Chronic Rheumatic Disease*

Hæmoglobin grammes per 100 c.cm.	Atrophic (rheumatoid) arthritis.			Osteo-arthritis.			Non-articular rheumatism.		
	M	F	M+F and p.c.	M	F	M+F and p.c.	M	F	M+F and p.c.
16–17 ..	1	–	1 (1·1)	3	–	3 (13·0)	1	–	1 (1·8)
15–16 ..	–	–	–	2	1	3 (13·0)	3	3	6 (11·0)
14–15 ..	8	8	16 (17·4)	1	4	5 (21·8)	10	6	16 (29·1)
13–14 ..	5	19	24 (26·1)	3	4	7 (30·4)	6	7	13 (23·6)
12–13 ..	7	20	27 (29·3)	3	1	4 (17·4)	7	9	16 (29·1)
11–12 ..	2	10	12 (13·0)	–	–	–	1	1	2 (3·6)
10–11 ..	1	9	10 (10·9)	–	–	–	–	1	1 (1·8)
9–10 ..	–	1	1 (1·1)	–	1	1 (4·4)	–	–	–
Below 9 ..	–	1	1 (1·1)	–	–	–	–	–	–
Total cases..	24	68	92	12	11	23	28	27	55

TABLE III

Males.	Total number of cases with—							
	No free HCl.		Hypo-chlor-hydria.		Normal.		Hyper-chlor-hydria.	
	M.	F.	M.	F.	M.	F.	M.	F.
(*a*) Atrophic arthritis ..	3	23	–	5	11	23	2	2
(*b*) Osteo-arthritis ..	–	–	–	1	3	5	1	1
(*c*) Non-articular rheumatism ..	–	1	–	1	4	12	1	1

M = male. F = female.

GASTRIC ANACIDITY AND ANÆMIA

Analysis of the gastric contents by the fractional test-meal was performed on 100 cases (Table III.), on which, also, full blood examinations were made. Histamine injections were not given, but the stomach was washed out with water after the withdrawal of the resting juice.

The high incidence of anacidity among the female cases of Group A led me to investigate the influence of this upon the blood picture, and I found anæmia to be most frequent and most severe in this particular group.

It is clear from the figures in Table IV. that achylia is not a constant feature in the anæmia accompanying atrophic arthritis, and that severe anæmia may develop in this disease even in the presence of a normal acid gastric secretion.

CLINICAL SIGNS; HISTORY; DIET

A pallid or sallow complexion is common among arthritic patients, and is not always an index of the state of the blood. It is surprising how often the blood picture will be found normal, or nearly so, in

such cases. Definite glossitis was present in only two anæmic patients. Painful and brittle finger-nails, a common accompaniment of idiopathic hypochromic anæmia [8] is also commonly met with in atrophic (rheumatoid) arthritis, and cannot be accepted as evidence of a primary anæmic state.

TABLE IV

Hæmoglobin Content and Colour-Index in relation to Gastric Function in 53 Female Cases of Atrophic Arthritis

(Figures are total numbers of cases)

Fractional test-meal.	Hæmoglobin, grammes per cent.							
	15–16	14–15	13–14	12–13	11–12	10–11	9–10	9
Achlorhydria	–	2	10	5	5	1	–	–
Hypochlorhydria ..	–	–	–	3	–	2	–	–
Normal ..	2	4	3	4	4	3	2	1
Hyperchlorhydria ..	–	2	–	–	–	–	–	–

—	Colour-index (100% Hb.=15·57 grammes per cent.).							
	0·90 or more	0·85 to 0·89	0·80 to 0·84	0·75 to 0·79	0·70 to 0·74	0·65 to 0·69	0·60 to 0·64	Less than 0·60
Achlorhydria	1	6	8	5	3	–	–	–
Hypochlorhydria ..	–	–	3	1	–	–	1	–
Normal ..	3	7	4	3	3	–	2	1
Hyperchlorhydria ..	1	1	–	–	–	–	–	–

The age of the patient has no influence on the anæmia. It would appear, however, that the duration of the disease is a factor in increasing the degree of anæmia. Two cases of polyarthritis, one male and one female, were admitted to the hospital within a few months of the onset of the disease and, at that time, showed a blood hæmoglobin of 94 and 90 per cent. respectively. Two and a half years later the disease was still active and the hæmoglobin had fallen to 70 in the male and 56 in the female. There was nothing in the histories to suggest a cause, other than the arthritic process, for this anæmia. It is the view of most authorities, and I agree with this, that the anæmia is secondary to the arthritis, and does not usually precede its onset.

For many years it has been customary for sufferers from rheumatic complaints to restrict or modify their diet. Many of our patients have, therefore, been asked in detail about their diet, but in only two cases with severe anæmia might this have been due to dietary deficiency. It is interesting to note that these two cases were two of the three patients with non-articular rheumatism and less than 12 g. per cent. hæmoglobin, and that both eventually responded to simple iron therapy. In both, meat had been excluded from the diet and green vegetables had been restricted for some years.

CONCLUSIONS

1. Anæmia, due to a diminished hæmoglobin content of the blood with a relatively insignificant fall in the red cell count, is common among patients with chronic rheumatic conditions.

2. Such an anæmia is far more common amongst female patients.

3. The severer degrees of anæmia are practically only encountered in cases of atrophic (rheumatoid or "infective") arthritis.

4. Although anacidity was frequently found among female patients with atrophic arthritis, deficient gastric secretion is not a constant factor in the production of anæmia in these cases. Anæmia of equal severity is encountered in cases with normal fractional test-meal curves, as in cases with deficient acid secretion.

5. There is no specific anæmia accompanying the chronic rheumatic conditions. The anæmia is a simple hypochromic anæmia secondary to the disease process.

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SIMPLE ULCER OF THE LARGE BOWEL

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ABOUT fifty cases of simple ulcer of the colon or other parts of the large bowel have been described by various writers, and some of them—e.g., Quénu and Duval, Soupault, Levy, and Barron—have added to reports of patients whom they themselves had observed an analysis of collected cases. From these accounts it is clear that the cases present themselves in two chief groups, the majority with symptoms of perforation into the peritoneal cavity, the minority with no perforation. The perforating ulcer either develops acutely (like the P.G.U. of hospital conversation) or progresses more slowly to abscess formation. The non-perforating ulcer produces symptoms and signs often not unlike those of neoplasm of the large bowel, for which indeed it has been mistaken. I propose to illustrate these groups with an account of one proved case of non-perforating ulcer and briefer mention of two probable cases of the perforating type, all personally observed. The condition has been defined by Quénu and Duval (quoted by Soupault) as "une groupe des lésions ulcéreuses ne relevant de l'action d'aucun microbe specifique, ni de l'action locale d'aucun agent chimique, et qui ne sont pas secondaire à une lésion initiale (ulcération audessus d'un rétrécissement, ulcérations du tumeurs)." In these days of advancing biochemistry the term "agent chimique" may be found too sweeping; presumably the authors meant it to apply to such chemical bodies as acids, alkalis, metals and their salts which have a caustic action.

Non-Perforating Ulcer

A single woman of 37 years had suffered for years from pains in the sacral region and all over the abdomen. During the past few months these were worse in the right lower quadrant. At the age of 18 years she had "ulceration of the stomach," and from time to time there were recurrent attacks of similar pain.

DIAGNOSIS

On March 18th, 1925, her pain began to be more severe than usual. It was felt around the waist at first and then tended to settle in the right lower abdomen though felt generally. It was described as sharp in character above and griping in the lower abdomen. Vomiting did

not occur. The bowels were usually constipated, but there was an action on the day of onset of present trouble and pain had followed. Some frequency of micturition was reported. Her doctor noted a swelling in the right abdomen, and I was asked to see her on March 18th.

At my first examination, the patient moved freely in bed and did not appear to be very ill. The temperature was 100° F.; the pulse varied between 100 and 108, being of fair volume and tension. The tongue was slightly furred and moist, and no abnormality was noted in the throat or chest. The skin of the abdomen was pigmented from the frequent application of hot-water bottles. The wall moved readily on respiration but became resistant upon palpation. A tender swelling about the size of a hen's egg was made out in the line of the ascending colon, and it appeared to me to be fixed, though the patient's doctor had noted its mobility. There was a mobile retroverted uterus with cervical discharge but no other pelvic abnormality. The urine was normal on routine examination.

The patient was removed to hospital with a provisional diagnosis of appendicitis and an enema was given followed by considerable relief. The swelling, though unaltered in size, became less tender and more mobile. The temperature fell to 97° F. and the pulse-rate to 80. A barium enema was found to pass readily to a point just proximal to the hepatic flexure. A barium meal showed narrowing at the site of the swelling. A white cell count gave the following result: total 11,200; polymorphs. 69 per cent., eosinophils 1 per cent., lymphocytes 24 per cent., and large mononuclears 6 per cent. The swelling became smaller, apparently because of release of bowel contents since bowel action was fairly good. The diagnosis was, revised to that of carcinoma of the ascending colon and operation was advised.

THE OPERATION

On March 25th the abdomen was opened under gas, oxygen, and spinal (stovaine) anæsthesia. General examination having revealed no other lesion, ablation of the cæcum, ascending colon, and hepatic flexure was carried out for what appeared to be a carcinoma of the ascending colon. It was noted that the "growth" involved the inner aspect of the bowel only, and did not completely encircle it. The surface was irregular and pinkish-yellow in colour. There was little or no involvement of the lymph glands of the area. No special difficulty was met with except in the separation of the mass from the second part of the duodenum. An anastomosis between the ileum and the proximal transverse colon was made and the peritoneum adjusted over the bare area. The abdominal wall was closed in layers. After a very stormy convalescence, the patient eventually made a good recovery. During the first year following the operation she suffered occasionally from colicky pain. She has reported to me from time to time up to the present with indefinite indigestion, vague "rheumatic" pains in the body generally, such as had often been felt before the operation, and painful breasts. There is still a tendency to constipation.

PATHOLOGY

The specimen was examined after hardening in formalin. Two irregularly rounded ulcers were seen side by side on the medial wall of the colon separated by a strip of intact mucosa. The diameter of each was rather less than ½ in. The edges were sharply defined, steep, and not nodular. The base was smooth and its external surface (i.e., that away from the lumen) was irregular. Section of the ulcer showed an outline closely resembling that of a chronic ulcer of the stomach. There was a thick deposit of yellowish tissue forming the base, which thinned gradually in a centrifugal direction.

Microscopic examination showed at the edge of the ulcer an abrupt loss of the epithelium, which was infolded toward the base. The cell nuclei of the surface epithelium and mucous glands close to the edge did not stain well. There was much infiltration of the mucosa and submucous layer with round cells. The muscularis mucosæ disappeared close to the edge and the muscle coat was thickly infiltrated with round cells and broken up toward the ulcer. Everywhere close to the ulcer margin, polymorphonuclear and plasma cells were plentiful. In the muscular coat, a considerable number of vessels were undergoing obliterative endarteritis but the majority appeared to be quite healthy. Several had a surrounding cloud of round cells. The base of the ulcer was formed of granulation tissue, very thickly infiltrated with round cells but with relatively fewer polymorphonuclear and plasma cells.

Perforating Ulcers

(1) ACUTE TYPE

A woman 50 years, married twice (in spite of congenital absence of the uterus), suffered from colicky pain in the lower abdomen for three days. The bowel acted after castor-oil with relief to the pain, but there was a recurrence in a day of so, and the character of the pain changed. It was now severe, constant and referred to the epigastrium. More castor oil was followed by vomiting as well as purging, and the bowel acted daily afterwards though the usual habit was costive. The pain persisted and was especially bad during defæcation.

Ten days after the onset, she was admitted to hospital on the advice of my friend and colleague, Mr. James McClure. The temperature was 99·4° F. The pulse-rate 126. The patient, a stout woman, breathed with difficulty and showed obvious signs of bronchitis. The abdomen was distended, especially in left iliac fossa and left flank, and the wall was rigid. No defined mass was palpable. There was great tenderness. The external genitalia were well formed and pelvic examination confirmed the absence of the uterus. There was much tenderness in the pelvis.

The abdomen was opened by a left paramedian incision and a large quantity of purulent fluid came away from the pelvis. The appendix was merely injected externally. Coils of small intestine were matted together at the lower end of the pelvic colon and some thickening was felt in the mesentery of the latter, but no definite perforation was made out. The abdomen was closed, drainage being provided by a large rubber tube into the pelvis.

Death took place in a few days with no improvement, and a limited post-mortem examination disclosed a perforation in the lower end of the pelvic colon at first into the mesentery and then into the peritoneal cavity. The internal genitalia were apparently absent.

No microscopic examination of the affected part was made. There may be some doubt as to a single perforated diverticulum being the explanation. No other diverticula were noted and they are usually multiple.

(2) SLOWLY PERFORATING TYPE

A woman 73 years, was admitted to hospital on May 19th, 1929. On May 17th she began to suffer from pain generalised around the abdomen, settling later in the right side, where it remained. It was described as a constant dull ache, made worse by walking. There were loss of appetite, headache, and malaise, and on day of onset nausea and vomiting. The vomit was undigested food. The bowels, which usually acted only with medicine, had opened on 19th and no blood or slime had been noticed. Micturition was normal. There was slight cough with some spit.

The patient was pale. Her temperature was 100·4° F., pulse-rate 96. The tongue was dry and slightly furred. No abnormality was noted in the chest or in the nervous system. The urine was normal. A bulging was seen in the right lower abdomen, which moved well on respiration. There was slight general distension but no rigidity was made out. There was a tender fixed mass about 2½ in. by 1½ in. inside the anterior superior iliac spine, extending upwards into right loin. It was irregular in outline. No abnormality was made out in the pelvis. The urine was normal on routine examination. There was a past history of "influenza and inflammation o

the bladder" three months previous to present illness. Since then there had been slight pain in the right side of the abdomen and more constipation than usual.

Upon a diagnosis of appendix abscess, a muscle-splitting incision was made over the most prominent part of the swelling and about three ounces of brownish foul-smelling pus evacuated. There was a necrotic patch on the antero-external wall of the ascending colon with a perforation in the centre. The appendices epiplocæ adjoining were swollen and œdematous. The appendix was not anywhere visible in the abscess wall. The perforation was infolded with catgut sutures and the abdominal wall closed around a rubber drain.

A fæcal fistula developed after several days and slowly closed. An abscess in the left parotid gland was evacuated on May 24th. The patient was discharged from hospital on July 21st. She has reported from time to time since, having developed a ventral hernia in the scar. Apart from the hernia, which is not easily controlled by a belt, the patient has since enjoyed fairly good health for her age.

There is in this case the natural doubt about the appendix having been the cause of the abscess and the operation having taken place at a time when it was about to burst into the ascending colon. A careful though not exhaustive search was made for the appendix which was not seen or felt in the abscess wall. No stercolith was discovered. There has been no sign of appendicitis since. I am, surgically speaking, reasonably satisfied that the case was one of ulcer, wanting though it may have been in the pathological or legal standard of proof.

Comment

The symptomatology is sufficiently illustrated in the above accounts. In none of the reported cases has a correct preoperative diagnosis been made. In the perforating type, the symptoms are usually ascribed to appendicitis, perforation of ulcer of the duodenum or stomach, or to diverticulitis. It may be very difficult even at operation or post-mortem examination definitely to exclude the last. There are often no symptoms previous to the acute onset of grave illness caused by the perforation, though in the abscess cases the evolution is slower. Sometimes recurrent attacks of colicky pain and abdominal distension with constipation occur and the attacks pass off with diarrhœa; perforation then takes place in a more severe attack than usual.

In the non-perforating type there is often a palpable and mobile swelling, which is diagnosed as a growth of the bowel. In Landqvist's case, however, no swelling was palpable, and in such appendicitis will probably be the favoured diagnosis with right-sided symptoms and diverticulitis with left. It is to be noted that palpable mobile swellings have usually been detected on the right side. In Mintz's case, the ulcer was situated at the apex of an intussusception of rather chronic course, which was the immediate indication for operation.

At operation, the perforating ulcer discloses itself by signs similar to those seen in perforating ulcers of the duodenum or stomach. The non-perforating is recognised by an area of induration and injection, covered with lymph or perhaps tending to necrosis, with a depressed centre corresponding to the ulcer crater. On the other hand it may closely resemble a carcinoma of the bowel wall, especially where there is a considerable deposit of fibrous tissue. This was the condition in Morel and Seycheron's case and in my own. In both, however, closer examination revealed that only a portion of the circumference of the wall was involved, and it is unusual at operation to find a carcinoma thus limited. The simple ulcer is often rounded, but if oval tends to spread transversely across the bowel.

Simple ulcer affects males more than females and is commonest between 40–50 years of age. It occurs chiefly in the cæcum and ascending colon, and in the pelvic colon, though any part of the large bowel including the rectum may be affected. Its size varies up to the diameter of a five shilling piece. Various suggestions have been made as to its ætiology, which has been given as inflammatory, bacterial, neurogenic or trophic, digestive or peptic, mechanical, and circulatory (from arterio-sclerosis, thrombosis, or embolus). The one common point in the great majority of the patients is habitual constipation. This, if sufficiently bad, might give rise to an ulcer mechanically by trauma, the persistence and spread being helped by bacterial action from the prolific intestinal flora. If the digestive juices survive the ileocæcal valve, there would be ample opportunity in the constipated person for their action in an acid medium in the cæcum—and the discharge from a cæcostomy in those cases where I have tested it with litmus paper has been acid. It is difficult to fit in the neurogenic or trophic factor. It may apply to the "visceroptotic" patient, but many of the subjects of simple ulcer are not of this type. In Landqvist's case there was thrombosis in the veins at the base of the ulcer; in Morel and Seycheron's and in my own, endarteritis obliterans was noted in several small vessels. The endarteritis has seemed to me to be secondary to the progress of the ulceration, and not to initiate or precede it, though Quénu and Duval express the opposite view. At present it would seem that no one ætiological view can be proved—or disproved.

The prognosis is not good, as might be expected in a condition where the usual manifestation is soiling of the peritoneum from the cæcal or sigmoid cesspool. The post-operative mortality has been as high as 50 per cent.

Surgical treatment has varied from drainage of the peritoneum, stitching and local excision of the ulcer up to extensive ablation of the bowel. It has depended upon the degree of accuracy of diagnosis at operation and the state of the peritoneum. The ideal treatment in the non-perforated case would be excision of the ulcer or of the ulcer bearing segment of the bowel with repair and proximal provision for gas escape. Closure of the opening and drainage of the peritoneum are necessities in the perforated type. Determination of the procedure to be adopted should be founded on the "safety first" principle, based upon a consideration of the local findings and the patient's general condition.

It is a pleasant duty to acknowledge my indebtedness to Dr. H. H. Sanguinetti, who was responsible for the pathological examination in Case 1, and to Mr. James McClure, assisted by whose advice I operated upon Case 2.

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OBSERVATIONS ON CHOREA

THE ENVIRONMENTAL FACTOR

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Late last summer I found myself in possession of clinical notes of over 200 cases of chorea, personally observed in hospital or private practice. I was greatly depressed by the severity and chronicity of this disease and by our ignorance of its cause and cure. When I began to reflect upon its incidence several generalisations became clear:—

1. Chorea has always been common in Sunderland, but it is quite rare in the airy uplands to the south and west of the town. And it is distinctly rare in the lovely grassy valleys to the south and west of Darlington.

2. There appears to be a definite relationship between population-density and chorea.

3. Chorea is quite uncommon in Children's Homes and similar institutions where sound wholesome food, regular meals, and punctual hours of sleep prevail.

I have been able to trace 188 patients and make complete inquiries, on a formal plan, respecting medical and social states, diet, housing, environment, temperament, and a good many similar matters. The children for the most part were typical specimens of what Vining [1] calls the "debilitated child," but most of them were pleasant and gentle. All except 7 came from lowly homes. Boys numbered 62 and girls 126, and the age-incidence rose steeply to a maximum at eight years, afterwards falling slowly, with a small secondary peak about puberty. The onset of chorea was maximal in December and January and minimal in July, August, and September.

My inquiries into the present state of the patients gave the following results:—

Dead from endocarditis	3
Found to have organic heart disease	21
Subject to a single recurrence of chorea	28
Subject to several recurrences	17
Subject to residual restlessness	16
Total	85

Many others were found to be in indifferent health of one sort or another, to which irrelevant factors contributed.

CAUSATION

I agree with other writers that there is no physical criterion of a liability to chorea; but the following information bearing on causation was obtained.

Previous definite and considerable disease of the tonsils	29
Excessive carbohydrate in the diet	39
Provocative illness, such as scarlet fever	10
Imitation, alleged on good grounds	1
Family history of chorea	6

There is one ætiological factor which I cannot reduce to statistical form; but from discussions with the parents and from domiciliary visits made by my helpers I am sure it should be emphasised. That factor is a lack of fresh milk in the child's diet. I came to this conclusion before I was aware of the work of Stephens,[2] Warner,[3] and Mutch [4] on calcium deficiency in this disease. Another highly important factor is previous prolonged general poor health and catarrh.

As regards social environment the following facts may be noted. In 60 cases the patient came from a family in which there were six or more children. In 19 cases one parent was dead or otherwise missing, and in a further 23 one parent was odd, eccentric, or invalid in some way. Damp and draughts were conspicuous in the homes of 40 children, and in 44 cases reports of serious noise were secured and checked, e.g.—

"In the tenement flat above are 10 children."
"Neighbours very noisy all night. Much fighting."
"Neighbours upstairs hold prayer-meetings every night."
"Very noisy street swarming with children."
"House very noisy until 1 A.M."
"Lives over a wireless shop."

In 31 cases serious and astonishing overcrowding was found, e.g.—

"Six persons living in one room with two beds."
"Three rooms, all below street level."
"One lavatory for 30 persons."
"Family of 9, four rooms; dark, damp, and verminous."
"Two rooms for family of 9. Lying low near the river."
"One lavatory and one tap for 25 persons."

In 65 cases the patient came from a family living seriously below the level of subsistence when food, rent, and transport are taken into account. Here is a selection of family budgets:—

No. in family.	Total income.	Rent.	No. in family.	Total income.	Rent.
6	34/–	8/3	7	30/–	6/–
4	35/6	11/6	6	32/–	6/–
8	37/3	13/10	6	32/–	6/9
6	37/–	4/9	5	42/–	8/6
4	35/–	6/–	8	45/–	12/6
3	18/–	4/6	4	22/6	8/3
6	34/–	13/–			

Emotional factors were investigated, but the figures probably are low because all information was rejected if it could not be checked independently.

Serious and prolonged deprivation of sleep	37
Exposure to a premature religiosity	9
Exposure to inordinate affection	19
Exposure to notorious and prolonged family jars	6
Personal and peculiar anxiety or fear	10

There are other emotional factors of which I feel convinced but which I cannot present in statistics. Thus I believe that chorea is apt to occur in a child upon whom family and domestic responsibilities are prematurely thrust.

For one cause or another the patients of this review were long victims of generally lowered bodily health and obvious debility, anorexia, and catarrh. As a rule the parents could not attribute the onset of the disease to any single event; but a few records were secured, as follows, in which the onset seemed to bear a close relationship to particular events or stresses.

(*a*) Physical injury on trauma (e.g., scald, lacerated scalp, injuries in a fire, severe caning at school, and dog-bite.)	26
(*b*) Emotional strain (e.g., excitement of getting work as a maid, fright in the swimming baths (3 cases), "too much education" (3 cases), scholarship attempts (2 cases), suddenly startled by noise, and aroused out of sleep-walking.)	16

These figures are very much smaller than I would have expected.

CLINICAL SIGNS AND TREATMENT

I am aware of sundry classifications of chorea but I venture to suggest a further description of the types as follows: (1) "Always fidgeting." (2) "Makes faces." (3) "Keeps dropping things." (4) "Gone off her feet." (5) "Won't talk." (6) "Keeps wriggling about." (7) "Right bad with her nerves."

The only treatment I found effective was quiet and rest in hospital with competent sympathetic nursing. I am no believer in treating choreic children by stern seclusion behind screens. On the contrary I am quite sure that these patients sigh and pine for a good deal of attention. Chorea makes a child touchy

and unstable, and the illness may be prolonged if she feels she is in any way of less importance than the others in the ward.

My patients were almost uniformly obedient, passive and quietly content in hospital. They appeared to have good appetites but were prone to constipation. I think severe cases recovered more quickly than mild cases but this is an impression which I have not been able to confirm.

I am much indebted to Miss W. H. Redmond, formerly house physician in the Sunderland Children's Hospital, and also to Miss McPherson, lady almoner, for valuable help.

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Clinical and Laboratory Notes

BLACKWATER FEVER IN A NEGRO CHILD

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IN a hyperendemic malarial region such as the Central Congo Forest native children either die of malignant malaria or gradually reach the condition called *prémunition* by Edmond Sergent—more generally known as "tolerance" by English malariologists. This progressively acquired freedom from febrile attacks, although parasites are still present in the blood and are frequently reinoculated by mosquitoes, goes hand in hand with an immunity from blackwater fever.

That natives from non-malarial regions are subject to severe fevers and blackwater when removed to endemic zones is well known, but among those who have acquired tolerance from childhood non-susceptibility to blackwater fever has until lately been regarded as almost absolute. Recent evidence has shown, however, that under certain conditions this protection may break down, and the following case with which I can find no parallel in my experience or in available records is an instance of this breakdown.

The patient was a boy, aged 2½, of full-blooded negro stock. For first eighteen months of life he attended the infant welfare clinic at Yakusu Hospital, and received the routine weekly dose of 0·04 to 0·10 gramme of quinine hydrochloride in solution. He had further quinine intermittently during and after this time when feverish.

Attack of hæmoglobinuria.—After two days' fever at his village he was brought to hospital on Feb. 5th, 1935, and was given a dose of 0·08 g. of quinine. Next day he passed normal urine at 6 A.M. and went with his mother to the market, where the passage of dark red urine was noticed. The parents had the sense to collect about 75 c.cm. in a tin and bring it to hospital. The child's condition was good: the temperature was 37·5° C. and the spleen three fingers-breadth below the costal margin. The urine was dark red and acid, and contained 0·7 per cent. of albumin; the deposit showed very scanty red cells and numerous granular and epithelial casts. Chemical tests for hæmoglobin positive. The blood showed malarial pigment in monocytes but no parasites.

Treatment and progress.—Copious drinks of 2½ per cent. solution of sodium bicarbonate were given. The next passage of urine was practically normal and next morning only a trace of albumin was left. On the third day a similar dose of 0·08 g. of quinine was given without untoward results. A week later scanty schizonts of *Plasmodium falciparum* were found in the blood. Two months later the child was well, the spleen now being only one fingers-breadth below the costal margin.

It is difficult to escape the conclusion that in this case hæmoglobinuria was definitely precipitated by the dose of quinine, given during a febrile period, to a child whose tolerance to malaria had been retarded by frequent quinine medication. *P. falciparum* and *P. malariæ* are the commonest parasites, *P. vivax* and *P. ovale* also occur in this region. The splenic index in the neighbourhood is 100 at the age of 2–3. Infant mortality is computed at about 500 per 1000, and is mainly due to pneumonia or diarrhœa complicating the frequent malarial attacks of the first two years. Intense infection with *P. falciparum* is often responsible for sudden death.

Mortality among the clinic babies is less than 150 per 1000 and we attribute this result mainly to the assistance of the regular weekly (occasionally more frequent) dose of quinine, which helps them to tide over the dangers attending the acquisition of tolerance. In the last ten years over 1000 babies have attended the clinic and this is the only case in which hæmoglobinuria has been observed. The disease is of course unknown to local inhabitants.

From the Katanga copper mining areas Leclef [1] and de Decker [2] have reported 28 cases of blackwater fever with 3 deaths among natives whom they state came from regions where malaria is endemic. Leclef attributed his cases to the unaccustomed dose of 1 to 2 g. of quinine, and in de Decker's 17 cases quinine had been given to his knowledge in all but 4 before the onset of the blackwater. He considers however that liability to blackwater was due to the predisposing causes of debility among bush natives working in industrial conditions.

There seems to be little doubt therefore that, both in adults and children of the negro race, the irregular use of quinine, especially in moderate or large doses during a febrile period, can precipitate hæmoglobinuria, just as it does among Europeans and Asiatics. There is no indication however that the generally accepted opinion as to the value of regular prophylactic quinine in assisting the acquisition of tolerance to malaria should be modified. That it may retard it, both among blacks and whites living in bush conditions in endemic areas, is quite possible. But the attendant dangers of pernicious attacks and later of blackwater fever are much diminished by its use.

ANURIA TREATED WITH SPINAL ANÆSTHESIA

BY D. S. HAYES, M.R.C.S. Eng.
LATE RESIDENT MEDICAL OFFICER, HOSPITAL ST. CROSS, RUGBY; AND
R. H. PARAMORE, F.R.C.S. Eng.
HON. GYNÆCOLOGICAL SURGEON TO THE HOSPITAL

IN the following case a young man had signs of intestinal obstruction after appendicectomy and subsequently developed anuria. The latter was relieved by spinal anæsthesia, and the case is reported because it may throw light on anuria occurring in other conditions—e.g., after labour or prostatectomy.

A well-made young farmer of 25, after his third attack of appendicitis, had his appendix removed on May 29th, 1932. Battle's incision was chosen, and the operation was difficult. The cæcum could not be delivered, and the base of the appendix was displayed only after enlarging the wound. The appendix passed over the brim into the

[1] Leclef: Ann. Soc. belge de méd. trop., 1931, xi., 293.
[2] de Decker: Ibid., 1932, xii., 213.

pelvis, to the wall of which it was adherent: it ended in an indurated mass, thought to be an enlarged gland, with which it was removed. A rubber tube was inserted and the wound closed. The distal mass consisted of coils of the appendix; and from a raw area present it seemed that the tip had been left behind.

The next day (May 30th) the abdomen was fuller than expected, and there was a good deal of hæmorrhagic discharge from the wound. On the 31st the abdomen was distended and tender; vomiting occurred; enemata were ineffective. The drainage-tube was replaced by a larger one under spinal anæsthesia; it was hoped this would relieve the abdominal distension, but an enema given later produced little result. On June 1st the bowels were well opened, but the abdomen remained distended, though the vomiting had stopped. The hæmorrhagic discharge from the wound increased; chlorine dressings were applied; there was no suppuration.

On June 2nd the wound was irrigated with dilute chlorine solution, and the irrigation was repeated several times—possibly under pressure, which had not been desired. In any case the condition of the abdomen got worse, and on June 4th it was explored medianly. The small intestines in the lower abdomen were found matted together and covered with a thin layer of blood; there was no adhesion to the parietal peritoneum. Douglas's pouch was cleaned out, necrotic material being removed. No attempt was made to unravel the agglutinated intestines; a large drainage-tube was inserted and the wound closed. On the 6th both tubes—the median and the lateral—were removed, reliance being placed on fomentations, radiant heat, and general nursing.

During the next ten days the patient passed through a critical time. The abdomen was very distended and tense, vomiting frequent, and enemata of little effect. The distension became so great that the wounds began to give way and coils of intestine appeared at both of them; thick pus was now freely discharging from the lateral wound, where the cæcum came to view. As a result of treatment the vomiting diminished, fæces and flatus were passed in small quantities, and the abdominal distension gradually became less, but not uniformly. The prominence of the lower right quadrant of the abdomen proved on palpation to be an indefinite mass, consisting of dilated and adherent small intestines. On June 15th the patient was so improved that a little solid food was allowed. The next day an injection of pituitrin followed by an enema produced a good fæcal result. On the 20th the abdomen was flaccid except in the right ilio-umbilical region, where the prominence persisted. The urine was free of albumin and slightly acid; it had a specific gravity of 1014.

Improvement continued slowly, pain and distension recurring occasionally. On July 12th the patient was allowed out in a spinal carriage. The same evening he vomited and complained of abdominal pain, but passed a good night. On the 13th abdominal pain persisted all day, getting gradually worse (4 P.M.). He vomited twice. Twelve ounces of urine were passed in the morning, difficulty and frequency of micturition appeared, and from 2 P.M. to 8 P.M. only one ounce of urine was passed. Heat was applied to the abdomen without advantage. At 8 P.M. the temperature was 100° F.; the patient was very restless and looked ill. Pain, flatulence, and vomiting prevented sleep until 2.45 A.M., though atropine gr. 1/100 and omnopon 0·5 c.cm. had been given at 11 P.M. Up to 8 A.M. no urine had been passed.

During the morning (July 14th) vomiting of green material persisted, but in the afternoon the patient slept. Heat to the body continued. At 6 P.M. the temperature was 101°; an enema without result. One ounce of urine was passed during the day, and on boiling it became solid. At 10 P.M. the blood pressure was 145 systolic, 105 diastolic. Spinal anæsthesia was induced, 1·9 c.cm. of tropacocaine being injected after some cerebro-spinal fluid had dribbled away. Sims's position, foot of bed on blocks. Fluid intake limited to three pints per 24 hours. At 2.45 A.M. a castor oil and turpentine enema, followed by a simple one, caused a good deal of flatus to pass. At 3 A.M. abdominal pain still present; atropine and omnopon repeated.

At 8 A.M. the next day (July 15th) the patient's condition appeared slightly improved; but the anuria persisting, the spinal anæsthesia was repeated (9.15 A.M.). The result was magical. At noon two ounces of urine were passed, containing much albumin (Esbach, 4·75), and at 3.30 P.M. a further thirteen ounces. This latter was of amber colour, clear, specific gravity 1010, showed only a trace of albumin, the Esbach being nil. At 5.45 P.M. three more ounces were passed, but at 9.45 P.M. only three drachms. During the afternoon nearly a pint of water with glucose had been taken; an enema had given only a slight fæcal result, and for the first time a fæcal leak appeared at the lateral wound. The night was more comfortable. No vomiting, but no urine. Bowels not opened, but a good deal of fæcal matter was discharged from the lateral wound.

The next day (July 16th) was one of anxiety; happily the blood pressure gradually fell; at 8.40 P.M., 136/98. At 1.20 P.M. an enema gave no result but mucus; there was considerable pain in lower abdomen, and hot bottles were still applied to abdomen and feet. Up to 8 P.M. no urine had been passed, but at 8.20 P.M. ten ounces were voided. During the night seventy-two ounces of urine were passed (12 hours), although there had been no obvious œdema.

From this time on the patient steadily improved. On July 17th the blood pressure was 135/98. There was still abdominal pain. Enemas were given four-hourly. At 7 P.M. there was a good fæcal result; fæces were still coming from the lateral wound, but gradually diminished. During the twenty-four hours 106 ounces of urine were passed. On the 18th the temperature was 100°. Barium was injected into the sinus of the lateral wound under some pressure and the abdomen radiographed. A large barium-filled space in the pelvis with divarications appeared, the barium being apparently mostly extra-intestinal. An enema at 7 P.M. produced formed fæces. Urine 30 ounces. Abdomen not distended. Blood pressure 130/98.

The further progress of the case was uneventful. There was no more vomiting. The bowels were opened naturally; a normal amount of urine, free from albumin, was passed. By July 25th the original wound had granulated over and the midline wound was healed. On August 26th the patient was discharged. The abdomen was flat, though there was occasional leakage from the lateral wound. A Curtis abdominal support was fitted after a few days. Three months later the patient looked extremely well and had gained two stones in weight. The urine was normal.

On May 9th, 1934, he was leading an active life as a milk roundsman. The median scar was in good condition; the lateral scar was considerably stretched, but there was no hernia, though a weakness could be felt on coughing. He wears his Curtis belt all the time. Urine again normal.

REMARKS

1. If at the start this man's abdomen had been opened in the middle line all the troubles which ensued would have been avoided. 2. Unfortunately, plastic peritonitis, limited to the right lower quadrant of the abdomen, with acute intestinal obstruction developed. 3. As a result of the straining and vomiting a block in the renal circulation occurred, producing anuria. 4. This was attributed to a congestion of the medulla of the kidneys, mechanically caused. 5. The choice of treatment for this condition is between decapsulation of the kidney, venesection, and the exhibition of some drug which greatly lowers the blood pressure. 6. Spinal anæsthesia was chosen for two reasons. First, it greatly lowers the blood pressure, and would thus relieve congestion of the renal medulla and allow the cortical activity to begin again. Secondly, it increases peristalsis, by which it was hoped the obstruction would be overcome—at least temporarily. 7. Put to the test, it more than met our expectations. Although but two injections, separated by twelve hours, were given, both the anuria and the gut obstruction were overcome. A recurrence of the anuria indeed looked likely, and perhaps it would have been better to have given a third injection after a further twelve

hours. The renal function however became fully re-established. The intestinal obstruction was completely and permanently overcome. One can only believe that the barrier was somehow broken down, a short circuit perhaps being produced: only in such way can one explain the absolute cure of this condition. 8. Suppression of urine in man is too often fatal. To restrict the fluid intake is easy; to induce a spinal anæsthesia requires but little skill. It is evident that in combination they may be capable of relieving anuria provided it is not due to long-standing disease or to blockage of the ureters.

AURICULAR FIBRILLATION AFTER EMETINE INJECTION

By Ibrahim Abdel Sayid, M.D. Cairo
MEDICAL SPECIALIST, BANI-SUEF HOSPITAL, EGYPT

Emetine injected into a vein weakens the heart's action and induces a fall of blood pressure, but when it is injected subcutaneously or given by the mouth the heart is not affected directly. In his "Pharmacology and Therapeutics," Cushny states that in the frog emetine causes a slowly advancing central paralysis; the contractions of the heart are rendered weak and irregular, and eventually cease from paralysis of the cardiac muscle. In the two following cases the drug appeared to induce auricular fibrillation on subcutaneous injection.

Case 1.—A woman, aged 40, had suffered from amœbic dysentery for two months. A year previously she had had acute rheumatic fever, complicated by endocarditis, and on examination she was found to have an organic systolic murmur over the mitral area, with moderate reduplication of the second pulmonary sound; the left border of the heart was at the nipple line. Pulse-rate 82; blood pressure 120/80. The heart was fairly compensated. She was given emetine hydrochloride 0·02 gramme with strychnine, subcutaneously, each day for six days. Two days after the last injection the auricles fibrillated. Her condition was very bad, but the heart was restored to normal rhythm with digitalis in ten days. Later the treatment of dysentery was completed with Yatren and emetine-bismuth-iodide pills.

Case 2.—The patient, a man aged 50, had chronic amœbic dysentery. When examined on Sept. 24th, 1934, he showed no signs of cardiac lesions. He was given one grain of emetine hydrochloride plus one milligramme of strychnine daily for six injections; then a course of yatren pills and enemata for ten days; and finally six more injections of emetine. He developed a very bad attack of auricular fibrillation. Normal rhythm was restored with digitalis and quinidine sulphate, but the patient was in bed for about three months, and when I last saw him, in February, the pulse-rate was over 100 and there were signs of myocardial degeneration.

I have observed palpitation and dyspnœa in other cases after emetine, and though the use of this drug is almost indispensable in amœbic dysentery its depressant action on the cardiac muscle is far from negligible. It should therefore be given with great care and only under strict medical supervision.

NEW INVENTIONS

A COMBINED URETHRAL DILATING BOUGIE AND CATHETER

The bougies here illustrated have the shape of the well-known Lister's bougies and in addition each bougie has a narrow tubular channel running through its long axis; they are made in three sizes, 4/7, 6/9, 8/11 Eng. gauge. The bougies are made of brass, nickel-plated, and are designed to obviate the necessity for a metal catheter, in dealing with that common surgical emergency, acute retention of the urine from a urethral stricture. As every surgeon knows, the passage of a bougie through a stricture is much easier than the passage of a metal catheter, even though the stricture has been first dilated by the bougie. The slow emptying of the bladder through the narrow channel in the bougie is an added advantage in this type of case. To the comparatively inexperienced worker, the flow of urine through the channel in the bougie is welcome confirmation of the successful passage of the bougie into the bladder. The bougies have proved very satisfactory in practice, as they are passed more easily than a metal catheter owing to the greater weight, better balance, and their bulbous ends, and I also prefer to use them instead of a metal catheter in cases of enlarged prostate, where occasionally it is necessary to use a metal catheter to relieve acute retention.

The set of bougies was made to my design by Messrs. Down Bros., London.

Milroy Paul, F.R.C.S. Eng.

A NEW TONSIL DISSECTOR

The dissector, here illustrated, designed for the enucleation of tonsils, has certain advantages, and has demonstrated its usefulness in routine hospital practice during the last year. The smooth tapered end is orthodox, being slightly curved, with semi-sharp edges, used solely for the purpose of incising the reflected mucous membrane of the tonsil, freeing the anterior pillar, the upper pole, and the posterior pillar in turn, preserving the pillars intact, and displaying the capsule. The reversed end is flattened and also slightly curved, terminating in a straight row of very fine serrations, the sides being smooth and semi-sharp. The serrated edge rests on, and is kept close to the tonsil, using it to separate the tonsillar bed gently away from the tonsil. Trauma and subsequent after-pain is reduced to a minimum, as it is impossible to injure the bed of the tonsil, and each movement that is made accomplishes its object, especially avoiding as far as possible repeated attempts to overcome the tough fibrous tissue in adults, who have had several attacks of inflammation, or quinsies. Also, incidentally, the length of anæsthesia is shortened. Hæmorrhage rapidly ceases, in most cases without ligaturing, and a smooth tonsillar bed remains. The dissection of tonsils in children is rapid and easy, with freedom from shock and post-operative bleeding.

Messrs. Mayer and Phelps, of New Cavendish-street, W., have kindly made this dissector for me.

E. Gwynne-Evans, M.B., B.S. Lond.

REVIEWS AND NOTICES OF BOOKS

Principles and Practice of Preventive Medicine

Edited by C. W. HUTT, M.A., M.D., M.R.C.P., D.P.H., Medical Officer of Health, Borough of Holborn; and H. HYSLOP THOMSON, M.D., D.P.H., Medical Officer of Health, County of Hertford. London: Methuen and Co., Ltd. 1935. Two vols. Pp. 1688. £3 13*s.* 6*d.*

THE publication of a comprehensive and authoritative work on preventive medicine from the British standpoint has been long overdue, and the two volumes edited by Dr. Hyslop Thomson and the late Dr. Hutt will not disappoint those who have been eagerly awaiting such an event. While the whole field of medicine and surgery is in one sense preventive, the term "preventive medicine" in the present book is restricted to what is commonly known as public health and hygiene, with the additions which a widening view has tended recently to include. Thus the older practitioners of public health might feel astonished at finding chapters on malignant disease, electricity and radiology, town and country planning, heredity, and hygiene in aviation in a book on preventive medicine, yet, with the possible exception of the 25 pages on electricity and radiology, no one would now cavil at their inclusion.

The book consists of 50 chapters, each on a distinct aspect of preventive medicine, contributed by 47 authorities on their respective subjects. It has been well coördinated by the editors and does not give that impression of diversity of aim and lack of balance so often found in composite books. The law dealing with each subject is collated at the end of its section and main references for further study follow each chapter. With a single exception (the ventilating fan on page 983) all the illustrations are good and to the point. Noteworthy chapters are those on infection, epidemiology, and immunity, by E. H. R. Harries—although perhaps the subject of bacteriophage is given undue prominence; on water and particularly on the hygiene of swimming baths, by Prof. J. W. Wilson; on refuse disposal, by G. Clark Trotter; on heredity, by Prof. F. A. E. Crew and Fraser Roberts; on insects and vermin, personal hygiene, and popular education in health, by the editors.

There are few omissions and still fewer misstatements. No mention seems to have been made of electric fires in the section on heating, nor has the importance of excluding "totters" and other trespassers from refuse dumps been alluded to in discussing refuse disposal. The paragraphs on the domiciliary treatment of poor-law patients might have explained more fully the various terms of service under which district medical officers work, and the maternal mortality-rate is not mentioned in the chapter on vital statistics nor is it defined, or the possible fallacies in it discussed, in the otherwise excellent chapter on maternal welfare. It is unfortunately not yet true that "*most* local supervising authorities provide post-graduate classes for midwives free of charge." Slips in proof-reading are remarkably few. The index, which occupies 109 pages of small print, makes reference both pleasant and easy.

This book will take its place as a standard textbook on public health and no medical officer of health can afford to be without it. To those whose appetite may have been stimulated by the lectures on the preventive aspects of medicine at King's College Hospital, which appeared in our columns for the greater part of a year (Oct., 1933–June, 1934) and were later published in book form, it will provide a most satisfying meal.

The Crippled and the Disabled

Rehabilitation of the Physically Handicapped in the United States. By H. H. KESSLER. Columbia University Press. London: Humphrey Milford, Oxford University Press. 1935. Pp. 337. 20*s.*

Dr. Kessler, though it does not appear on the title-page, is medical adviser to the New Jersey Rehabilitation Commission and to the Workmen's Compensation Bureau, and his book is a much more comprehensive survey than its title suggests. It attempts to outline critically the methods of dealing with all types of the physically and mentally unfit which have developed in modern times both in the United States and in Europe. The subject is divided into groups of the disabled—children, the industrially disabled, the chronically disabled (that is, those suffering from chronic disease), the war cripples, and the group of defects of special senses, and in each group the development of methods of treatment and of "rehabilitation" is studied in detail. There is a wealth of material which has been laboriously collected and ably presented, while the legislative details for the various States given in an appendix will greatly help the student.

The book condemns the social prejudice against the disabled. The term "disabled," Dr. Kessler writes, "is used to designate several groups of persons who are definitely handicapped in their effort to make a living because of physical disabilities of one sort or another." And he claims that we are all under a false impression as to what constitutes disability. "There is no such entity as a normal person, and many persons who are looked upon as disabled are by no means less capable of meeting the economic and social requirements of life than many apparently healthy persons." If this is meant to imply that because functional capacity does not prove organic health (which is admitted) organic disablement therefore does not prove functional limitation, we think the logic is faulty and unlikely to provide a satisfactory basis on which to work out large schemes for the disabled. While we are all in sympathy with the suggestion that it is the duty of the able-bodied to care for the well-being of those less fortunate, we cannot think that it is either economically possible or socially desirable, especially at the present crisis, that the disabled should be provided with work at the expense of those who are physically fitter. Work is no doubt the best stimulus, physical and mental, to the partially incapacitated; their morale suffers if they feel they are handicapped by the fact of disease or disablement, and they tend to develop (to use an Adlerian term) an "organ inferiority." But where it is a question of competition, it may be even worse to deprive an able-bodied man of his job; he is just as liable to feel inferior if he has no work, especially if replaced by one obviously less "fit" than himself. In particular does this apply to elderly people with chronic disease, who have had their good days, and to those suffering from incurable and progressive conditions. We may regret their disability, and yet feel that the needs of the community are better served by caring for and protecting these people rather than by allowing them to compete in the open market. In contrast to this no one will fail to approve all the measures described

as existing, or suggested as possible, for bettering the condition of the child cripple. Here the ultimate goal is the production of self-supporting citizens, and this can only be achieved by the combination of careful physical treatment, special education facilities, vocational training, and (last and most important) the "placement facilities and a method of close follow-up" which Dr. Kessler finds in London and not nearer home.

An interesting comparison is drawn by the author between the methods of dealing with the disabled. In the U.S.A. there is a wealth of legislation, the law and the State provide for the industrially or war disabled all along the line; he passes out of the hospital ward at an early stage into a congeries of other centres and agencies. The haphazard measures of this country are dismissed by the author in the sentence "The compensation laws of Great Britain contain no provision for rehabilitation. Such activities are carried on by private and philanthropic schemes," and he remarks "The United Kingdom does not have a compulsory employment act for disabled workers." It is true enough that services of this type have developed here on voluntary lines, but they are not any the worse for the element of personal service. The U.S.A. may be congratulated too on such voluntary associations as the Goodwill Industries which started in Boston from small beginnings and has developed far-reaching and self-supporting workshops which provide employment for many disabled. Similar to it is work of the Winifred Masterson Burke Relief Foundation, whose eleventh biennial report, just received, is testimony to the completeness of its equipment.

Medical Annual, 1935

Edited by H. LETHEBY TIDY, M.D., F.R.C.P., and A. RENDLE SHORT, M.D., F.R.C.S. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. Pp. 596. 20*s*.

Medical Annual General Index and Review, 1925-34

Same publishers. Pp. 450. 12*s*. 6*d*.

THE "Medical Annual" is too familiar to need description and too good to need recommendation. It succeeds extraordinarily well in presenting the new things of practical interest and value sorted out from the welter of the year's literature, and it does so with just enough discrimination, just enough detail, and just enough comment and synthesis from its able and experienced contributors, to make it invaluable to any doctor who wishes to be up to date in more than the narrowest of specialties. Five new names appear in this year's list of reviewers: Dr. Ivor Davies succeeds the late Vincent Coates in the section on rheumatic diseases; Dr. L. S. T. Burrell deals with pulmonary tuberculosis; and Mr. K. H. Pridie with orthopædic subjects. Dr. L. P. Lockhart writes a special article on medicine in an industrial state, and Mr. D. Harcourt Kitchin another on medico-legal problems and recent legal decisions. The editors have the impression that the progress of medical knowledge is speeding up; if so, the value of their Annual, which is a credit both to the English profession and to English medical publishing, is increasing.

This year there also appears the decennial general index, which, in addition to indexing all the headings in the last ten annuals, has a short finger-post article by each of the 30 reviewers, surveying his field and pointing to the spots where growth and development have been most active.

Triple Challenge

Or War, Whirligigs and Windmills. A Doctor's Memoirs of the years 1914 to 1929. By HUGH WANSEY BAYLY, M.C. London: Hutchinson and Co., Ltd. 1935. Pp. 396. 18*s*.

THE sub-title of this book, though not very definite, gives a good idea of the generous hotch-potch ladled out by Mr. Wansey Bayly. He has plenty of material, especially in his account of the war years, to make an intensely interesting book; but like many historians he cannot bear to discard the personal implications of his narrative, so that a sense of proportion is lost. For instance, he may describe how he lost his hat with as much circumstance as he does the Dogger Bank action. Those who can pardon these irrelevancies, however, will find the war chapters full of valuable information, as well as of stimulating writing. The author's patriotism takes a form which many will approve of and many will not—a fact that may rouse a spirit of controversy in the reader and sustain his interest in the political excursions. The closing chapters of the book deal with the attempt made after the war to provide facilities for educating the public in the prevention of venereal disease, and Mr. Bayly writes with inside knowledge of movements in which he took a prominent part, never disguising his own strong views.

The book is embellished with war pictures, one of which is a photograph of the hull of the *Blücher*, crowded with men, within a few moments of her sinking. The episode will give for some a sufficiently appalling answer to an appeal to ready militarism; on others a different impression may be produced.

Furneaux's Human Physiology

Revised by WILLIAM A. M. SMART, M.B., B.Sc. Lond., F.Z.S., Senior Demonstrator of Physiology; Lecturer in Pharmacology and Toxicology, London Hospital Medical College. London: Longmans, Green and Co., Ltd. 1935. Pp. 348. 4*s*.

FEW books contain so much in a small space as this excellent little manual, which includes a great deal of anatomy as well as physiology. The present edition is completely revised and intended primarily for the use of nurses. An account is given of all the systems of the body, and the exposition is brief, dogmatic, and to the point, all kinds and sizes of print being used for emphasis and the introduction of new words. An attractive feature is the inclusion in parentheses of Greek and Latin roots with their original meanings, and "the consideration of the evolutionary, comparative, and philosophical aspects of the subject." This quotation from the preface is a little ambitious considering the size of the book, but a praiseworthy attempt has been made to make it an introduction to biology as well as a text-book, and culture has not been entirely neglected in the cause of instruction. No secret is made of this as the main object however, and there is a summary at the end of each chapter and examination questions at the end of the book. As the book is designed for nurses (a special edition for schools exists, without the chapter on reproduction), it might perhaps have dealt a little more fully with the principles of dietetics and temperature control, though the author would be entitled to retort that to extend its scope further might be injudicious. Controversial points are, of course, treated rather cavalierly, and the purist might quarrel with one or two statements, but actual mistakes are few. One is the reference to œstrin as the active agent in the Aschheim-Zondek test for pregnancy.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 7, 1935

BOTULISM

AFTER an interval of almost exactly thirteen years the public have been startled by the occurrence of another group of deaths due to botulism. Since the Loch Maree tragedy in August, 1922, when eight persons died within a week in the West Highlands of Scotland, there have been no cases in this country officially certified as such, though several times suspicion has arisen. In Scotland there is no such thing as a coroner's inquest, but the Scottish Board of Health instructed two of its medical officers to make an extensive investigation, the results of which were later published in a book[1] which has remained the classical account of the disease. The poisoned food in the Loch Maree case was wild-duck paste in a glass container; the four persons whose death was investigated by the St. Pancras coroner last month (see p. 584) had eaten nut brawn, a vegetarian product made in London, also from a glass container. In neither case was there any indication that the food was abnormal or unfit for consumption, and in both of them the verdict acquitted the manufacturer of any neglect. In closing the inquest on August 23rd the coroner said there was no suggestion that food in bottles was any more dangerous than food in tins. The closing of the inquest, he added, would not mark the end of the attempt to find where the infection came from; three separate investigations are in hand and it will necessarily be some time before they are complete.

Botulism may be described as infection by a specific microbe, the *Bacillus botulinus*, which gains access to a mass of food material, and there, under very definite and special conditions, produces by multiplication and growth its deadly toxin. This toxin is consumed with the food and is responsible for the characteristic symptoms. The mere consumption of the organism itself is not sufficient to cause botulism; the ordinary conditions of the alimentary tract are not those in which it flourishes. The brilliant researches of K. F. MEYER and his colleagues in California established the fact that the *B. botulinus* is widely distributed in the soil. They analysed 1533 soils of various kinds—335 virgin soils, 274 cultivated soils, 142 garden soils, 161 soil and manure, 51 pasture soils, 570 from vegetables and feeds. Virgin soil, that is, soil unconnected with human habitation, domestic animals, or any form of cultivation, yielded the greatest number of positive results, no less than 37 per cent. containing the organism. Some of these were from mountains 12,000 feet high. Garden soils gave 41 positive out of the 142; soil and manure from animal yards, 20 out of 161; pastures, 19 out of 51; and of the 570 samples of soils under the heading of vegetables and feeds 134 were contaminated. The organism is thus most common in pasture, virgin, and vegetable soil; it is least common in cultivated, garden, and manured soil. Soils from many countries have since been examined, including England, Scotland, Denmark, Holland, Switzerland, Hawaii, and China, with similar results. The *B. botulinus* is apparently present in the soil everywhere. The resistance to heat of the spores from various strains of the organism varies considerably, but MEYER gave the maximum resistance to moist heat of the spores obtained from foods concerned in 26 human outbreaks as follows: 4 minutes at 120° C., 10 minutes at 115° C., 33 minutes at 110° C., 100 minutes at 105° C., and 330 minutes at 100° C.

The clinical picture of an acute case of botulism in man is characteristic and very terrible. There is no well-defined incubation stage. The patient may show no symptoms until he suddenly complains of double vision, caused by commencing paralysis of the muscles of the eyeball. Some have abdominal discomfort before this and there may be vomiting. Then follows more or less complete paralysis of the eyelids, producing ptosis. The patient will lift up his eyelids to see. Then the speech becomes blurred and indistinct. The pupils may or may not be dilated. In attempting to walk dizziness is shown by a staggering gait. Pain is absent at this or any other stage, but there is great discomfort and increasing distress. As a rule constipation is obstinate. There is no rise of temperature and no headache. Further paralytic symptoms soon follow. Difficulty of swallowing supervenes along with other signs of throat paralysis. The larynx is affected and speech becomes impossible. The patient, however, remains in full possession of his mental faculties and conscious of his own state and surroundings. He can even communicate freely by writing, though not by speech. Later air-hunger comes on, partly due to accumulation of mucus which cannot be swallowed or expelled, the various respiratory muscles weaken, including the diaphragm, and finally paralysis of the heart sets in, death occurring 36–72 hours after the onset. It will be noted from the symptoms that the toxin attacks mainly those cranial nerves which supply muscles, while those of special senses, such as hearing, seeing, smelling, are not involved. The mortality is very high. MEYER records 249 deaths in 396 cases, a rate of 62·8 per cent. It may be 100 per cent. in some outbreaks.

In spite, however, of the fact that *B. botulinus* is found in soils all over the world, botulism is one of the rarest of diseases in human beings. It is relatively more common in parts of the continent and in America than in this country for reasons well understood and connected with the national food habits of the people. In Germany the majority

[1] Botulism and Food Preservation (the Loch Maree Tragedy). By Gerald Leighton, M.D., F.R.S.E. London: W. Collins Sons and Co. 1923. 10*s*.

of the outbreaks have been associated with the eating of foodstuffs, such as sausages, which have not been thoroughly cooked, but only smoked. In America a number of cases have been associated with the canning or preserving at home of fruits and vegetables. Some of these home-preserved foods are consumed raw, as they come from the container—e.g., spinach and asparagus. American authorities are of opinion that the heating of preserved foods to a temperature of 80° C. is sufficient to destroy the toxin, and therefore to prevent botulism. Thus, it is to be noted, although the spores of the bacillus are highly resistant to heat, the deadly toxin is readily destroyed by temperatures commonly used in preparing foods. These and other facts, which have been worked out by bacteriologists and those concerned in canning processes, are now well known and duly provided for. The temperatures used by manufacturers of tinned foods are well above those necessary to destroy the toxin, and designed to kill the spores as well. They are, of course, far above any temperatures reached in domestic methods. The result is that, despite the millions of tins of food manufactured and consumed all over the world, botulism remains a rare condition, and, it is safe to say, will always remain so. Perhaps because of its rarity an outbreak causes concern and alarm out of all proportion to its prevalence.

THE BIRTH OF MEDICAL DEFENCE

THIS is the jubilee year of the Medical Defence Union and the annual report issued to its 18,000 members tells the story of its origin. In the year 1883 two Dulwich practitioners, Dr. EDMUND BOWER and Dr. W. COOPER KEATES were prosecuted first for negligence and then for manslaughter in consequence of their treatment of a child. It was a case of diphtheria with increasing obstruction in which the two doctors performed a tracheotomy and the father was asked to remove the obstruction by oral suction, which he did. Unfortunately he contracted diphtheria and to compensate himself against suffering and pecuniary loss he brought an action for negligence against the doctors. This failed and he then brought an action for manslaughter which was dismissed by the magistrate, without calling upon counsel for defence, with the remark that the case was one of persecution not prosecution. But the two doctors were by this time more than £1000 out of pocket, and this was felt by their fellow practitioners to be so unfair that a meeting was called at which Sir WILLIAM JENNER presided and considerably more than that sum was raised by public appeal. At this meeting a resolution was passed asking the Royal Colleges to press the Home Office to make some arrangement by which the public prosecutor might obtain the assistance of skilled advisers when called on to proceed against medical practitioners. A leading article in our columns at the time complained that the director of criminal prosecutions had "lent the weight and sanction of his great authority to the parading in a court of justice of such matters as the merest tyro in forensic medicine would have grasped and settled in a trice."

At that time the only medical defence association was a small affair which had never ventured to defend a medical practitioner in a court of law. The British Medical Association was therefore pressed by many of its branches to provide individual medical defence for members, but the Association was advised by counsel that its funds could not legally be used for that purpose. Hence it was that on Oct. 23rd, 1885, a Mr. C. F. RIDEAL and six other laymen registered the Medical Defence Union as a company limited by guarantee under the Companies Act of 1862 with offices at 16, Bedford-row, London. The early years of the union were difficult. It enlisted the support of that forceful but wayward personality, Mr. LAWSON TAIT, who became president of the union in 1887; but in the same year the union was nearly wrecked by the perfidy of one of its own staff, and its office was transferred to Birmingham, where Dr. LESLIE PHILLIPS was one of the joint honorary secretaries, Dr. A. G. BATEMAN remaining in London as the other. Both were hard workers and many cases in which medical men were threatened with legal proceedings were withdrawn, although it was not actually until 1889 that an action was fought in the courts, when damages were recovered from the Great Western Railway Provident Society for the wrongful dismissal of a surgeon. In the next year the framework of the union was revised with a view to ensure more continuity of method, but there were some among its members who feared the change and set up the London and Counties Medical Protection Society, with Dr. HUGH WOODS as one of its secretaries. The question of amalgamation was raised again and again, but nothing came of it, and now that the two societies have worked for so long side by side, with competition acting as a healthy stimulus to progress, it is perhaps no longer needful to regret these early quarrels. In 1893 LAWSON TAIT was succeeded in the presidential chair by Sir VICTOR HORSLEY who found there another outlet for his brilliant powers of organisation. Again in the following year a rift was threatened within the union, for many members resented the council's decision to defend one of their number against his former assistant, who was also a member of the union. The dispute was however settled by the adoption of the principle that the union would not ordinarily defend or support an action between members of the medical profession and that disputes between members of the union involving a breach of contract should be referred to arbitration. That was the last growing pain before the union entered on its maturity, interrupted only by a momentary tremor in 1903 when the British Medical Association reconsidered its decision not to provide individual medical defence for its members, but again turned it down.

The ideals of the Medical Defence Union, as the report indicates, are now happily expressed in its telegraphic address "Damocles" and in its

motto "Dextra Dare." The union expects each of its members to pay his subscription as a personal insurance premium to avert the stroke of the sword; but it also expects him to give it with his right hand, or in other words, with the same sympathetic motive of help to his brother practitioners which inspired the medical profession when it came so magnificently to the assistance of Dr. BOWER and Dr. KEATES. It is in this respect that the work of the union differs fundamentally from that of an ordinary insurance society. In the face of a substantial claim the directorate of an insurance society naturally considers every possible way of avoiding it, the object being to exclude as many claims as possible; the council of the union does its best in every case to bring the applicant within the union's sphere of action, the members of the council putting themselves in the position of the applicant in trouble. To this difference in practice Mr. OSWALD HEMPSON, speaking at a jubilee dinner of the council, ascribed a large part of the union's success; it was this, he said, that had made his work as solicitor to the union, and that of his father before him, seem so well worth doing.

INSULIN IN MALNUTRITION AND INFECTION

THE use of insulin apart from diabetes has never found much favour in this country, but elsewhere this remedy—so powerful in its own place—has been declared valuable in a variety of diseases. It was not unreasonable at least to hope that it might rectify some of the metabolic disturbances associated with acute infections, and SCHWENTKER and NOEL[1] have in fact recorded excellent results from its administration, with glucose, in hypertoxic diphtheria. Their results were so startling that the work was repeated in this country by BENN and co-workers.[2] But though these reported favourably on the effect of such treatment, they could record no such remarkable successes; and N. D. BEGG's recent investigations[3] suggest it is the dextrose, not the insulin, that is helpful in diphtheria. A second suggestion, that insulin should be prescribed for undernourished patients, finds support in the demonstration by OKADA and others that insulin increases alimentary secretion; from which it might be expected that assimilation of food would be accelerated. JOSLIN[4] believes that thin undernourished people whose emaciation is due to poor appetite can be induced by insulin to take more food, and speaks of its use in non-diabetic cases of tuberculosis. Its mode of action, he admits, is not entirely clear. FREYBERG,[5] for his part, leans to the view that the rise of weight sometimes obtained is wholly a result of increased ingestion of food, due to insulin causing contractions of the stomach, and even hunger pains. But most patients do not seem to have such gastric contractions and we are left without full explanation of the remarkably good results obtained by FALTA and some others who have used insulin for malnutrition in adults.

FREYBERG's own investigations now reported lead him to doubt whether insulin is valuable to the undernourished, and he remarks that "the number of satisfactorily controlled investigations of the value of insulin in undernutrition is conspicuously small." His studies are divided into two parts. The first concerns a group of 9 thin patients, 5 of whom were suffering from afebrile pulmonary tuberculosis, while the other 4 were psychoneurotic. Precautions were taken to prevent their knowing that they were receiving insulin and that an increase in appetite or hunger might be expected. The average duration of the experiments was twenty days and the average amount of insulin per patient was roughly 35 units daily. Of the 9 patients studied, 7 showed no increase in appetite, food-consumption, or rate of gain in weight—indeed 5 of them actually lost weight—and only 1 showed a weight increase. In the second part of the investigation an attempt was made to fatten patients and measure separately the effects of (1) a high caloric diet, (2) the diet plus injection of a placebo, and (3) the diet plus insulin. Of 11 patients studied in this way only 3 showed a response that could be attributed to insulin; in one of these, moreover, a high caloric diet was just as effectual, and in another it was found impossible to reproduce the beneficial effect when a second course of insulin was given. In all, therefore, only 2 patients out of 20 showed any improvement attributable to insulin, and it has to be recorded also that in 2 cases a placebo was apparently more effective than insulin in raising weight. FREYBERG's data show clearly a close correlation between caloric intake and weight changes, and he believes that only when insulin produces hunger pains can an increased caloric intake be anticipated. Unfortunately one may have hypoglycæmia without hunger pains, and this leaves an opening for serious risk. JOSLIN refers to another danger when he points out that "individualisation of the dosage should be emphasised especially in cases in which tuberculosis of the adrenals or liver is present."

The last word on this subject has certainly not yet been said, but FREYBERG's investigation is justified, if only because it shows what can be achieved in the treatment of undernutrition by suggestion.

[1] Schwentker, F. F., and Noel, W. W.: Bull. Johns Hopkins Hosp., 1929, xlv., 259; 1930, xlvi., 359.
[2] Benn, E. C., Hughes, E., and Alstead, S.: THE LANCET, 1932, i., 281.
[3] Begg, N. D.: Ibid., 1935, i., 480.
[4] Joslin, E. P.: Jour. Amer. Med. Assoc., August 3rd, 1935, p. 359.
[5] Freyberg, R. H.: Amer. Jour. Med. Sci., July, 1935, p. 27.

ST. BARTHOLOMEW'S HOSPITAL EXTENSION.—A special block for paying patients is to be built at this hospital, probably on the opposite side of Little Britain from the hospital itself. The funds for this block must come from outside sources, not from general funds, and from 90 to 100 beds are to be provided at a cost of something like £140,000. Thirty per cent. of the accommodation will be set aside for patients able to make some, but not full, payment, and this deficit may be made up out of the general fund.

ANNOTATIONS

ECONOMIC CATERING

THE Nutrition Committee of the British Medical Association issued its first report in 1933, as a supplement to the *British Medical Journal* of Nov. 25th. The committee had been appointed six months previously, its terms of reference being "to determine the minimum weekly expenditure on foodstuffs which must be incurred by families of varying size if health and working capacity are to be maintained, and to construct specimen diets." Our readers will remember the reasons set out for choosing 3400 calories instead of 3000 calories (Cathcart and Murray) as the standard man-value requirement, and the controversy which followed the difference between the estimates made by the committee on this basis and those made by a committee of the Ministry of Health. The B.M.A. committee obtained food prices from two sources: (1) some very detailed records available from Stockton-on-Tees, where inquiries had been made weekly over a period of two years from 16 grocers and 9 butchers patronised by working-class families; (2) lists supplied by certain medical officers of health of the prices current in their areas during two weeks in the summer of 1933. Using the mean of each of these sets of prices, 16 specimen weekly diets were compiled showing for each item its quantity, its price according to each standard, its content in protein, fat, and carbohydrate, and its caloric value. There remained the need to convince the public that such diets could actually be procured in the market at something like the estimated cost, and when prepared for consumption would give satisfaction to the families concerned. At the time no attempt was made to work out menus or to give advice on the cooking and preparation of meals, although the committee believed such a measure to be practicable and desirable if the housewife was to make full use of the information supplied in the report. They have now, in response to many requests, issued practical instructions which paraphrase their general scheme in terms of foodstuffs to be bought in the market, with detailed menus and recipes.

A pamphlet on family meals and catering which begins with a Sunday dinner of roast beef, Yorkshire pudding, green vegetables and potatoes, followed by rice pudding, disarms at least one common criticism against diets planned to the greatest economical advantage—that they are often composed of ingredients unfamiliar or unpalatable to the British public. The cold beef for Monday's dinner, followed by shepherd's pie on Tuesday, in the first week's menu is indeed so stereotyped in our homes that at first sight it may seem that the housewife will learn little that she does not already know. But the implied assurance from an influential quarter that on the whole she is already making the best of her resources, and the fact that the recipes are for the most part comparable with those already available in simple cookery books will encourage her to examine the differences and to take full advantage of those suggested on economic grounds. The diet chosen for exemplification is No. 16, designed to meet the requirements of a family consisting of a man and wife with three children, aged 6–8, 10–12, and 12–14. The items of this diet, according to the original Nutrition Committee report, represented a total caloric value of 97,863, the daily quantity of calories per man being 3385. The total first-class protein worked out to 1420 grammes and the daily first-class protein per man to 49 grammes. The cost of the food per man per week was 53·6*d.* (Stockton mean) and 65·5*d.* (B.M.A. mean), and the minimum weekly cost of the family's food 18*s.* 5½*d.* or 22*s.* 6½*d.*, according to which set of food prices was accepted. The items detailed, in the same quantities, are now set out in shopping lists for three consecutive weeks, with menus for midday dinner and high tea or supper for each of the 21 days. The shopping lists include certain items, such as kippers and corned beef, which do not appear in the menus and are presumably used for breakfast, while the fact that more oatmeal is bought each week than is used in the recipes suggests that the modern fear of porridge as a rickets-favouring article of diet is not shared by members of this committee. The fact that only 3 eggs are bought in each of the first two weeks and only 6 in the third week (where 4 fried eggs and onions figure on the menu of an evening meal from which the youngest child is apparently excluded) directs attention to such items as potato omelette and to the custard which presents an appetising suggestion for two of the Saturdays; it emerges that the "omelette" contains no eggs and that the custard is derived from custard powder.

It would be improper to cavil at the fact that throughout this pamphlet there is no mention of the cost of any items except such vegetables or fruits as may be bought in pennyworths—the amount allocated to these being 2*s.* each week. We may assume that the shopping list has been tested by actual trial in appropriate districts, and that the price of the ingredients has been found to correspond roughly with the sum allocated to food for this family in the report. Precision in specifying actual prices in named districts would, of course, have been of considerable interest; and the further omission of any hints for the planning of an adequate breakfast has the disadvantage that the housewife is left without guidance to the proportion of her budget to be allowed for this meal. The reason given for not stating prices is that they vary so much from place to place and from time to time. This has always been the contention of those who hold that any attempt to give advice in terms of actual purchases must fail, and the omissions in this beautifully produced pamphlet may serve to confirm their scepticism. On the other hand, the table of quantities of each of the foodstuffs named in recipes and the notes, for the use of teachers of domestic science, of their food values in terms of content of protein, fat, and carbohydrate, and of their caloric value per lb. will be generally appreciated. The pictorial arrangement of each main meal, daintily set out in casseroles or well-matched china on a spotless tablecloth, suggests the comparative leisure of a cookery student rather than that of a harassed housewife; and the attractive plates are in fact coloured reproductions of dishes cooked according to the recipes by students of the National Training College of Domestic Science in London in their second term.

This pamphlet will have a permanent value in providing schools of domestic science for working-class people with standards which are applicable in the homes of the pupils without modification. It can be obtained by such schools at 3*s.* the dozen copies, that is, at half the price of the separate copies, on application to the financial secretary of the British Medical Association.

OBSTETRICS IN DUBLIN

THE reputation of Dublin as one of the leading obstetric schools of the world has been maintained not only by the enthusiasm of successive generations of students and practitioners grateful for its practical teaching, but also by the clarity with which the clinical results obtained at the three maternity hospitals are every year correlated and presented. In the London hospitals no doubt the amount of supervised obstetric work is much larger, but most of this work is recorded and laboriously tabulated by the obstetric registrars, to little purpose. The medical reports from the three maternity hospitals of Dublin are presented to the section of obstetrics of the Irish Royal Academy of Medicine where the fruits of their discussion may be even more instructive than the reports on which it turns. Under its new master, Dr. Andrew Davidson, no drastic change has been made at the Rotunda in the methods and principles which have proved of value in the past. The maternal mortality remains at a commendably low level: in 1934 it was only 0·83 per cent. with a morbidity-rate of 4·2 per cent., despite the large number of complicated cases admitted. In the past 15 years this institution has been responsible for the supervision of some 57,000 confinements with 267 deaths, the percentage mortality being 0·46.

This year discussion at the section was concerned chiefly with some aspects of midwifery which are at the moment much in the public eye. Breech presentations, it seems, present no terrors to the Rotunda staff. External cephalic version was performed successfully in 19 cases, 18 infants being born alive. The fœtal mortality was however even less when the breech presentation was uncorrected, for then there were only 2 dead infants out of a total of 62. Such a record reflects the greatest credit upon the conduct of these cases. None of the reports throws much light on uterine inertia, which is by far the most ticklish problem that faces the obstetrician to-day. Dr. Davidson hopes that hormone therapy may provide the solution. Dr. Gibbon FitzGibbon simply asks that each case of this nature should be reported in detail. The treatment of 23 cases of placenta prævia was varied; last year's excellent results were not repeated. The vexed question of disproportion claims most attention in the reports. The master of the Rotunda condemns routine induction of labour by puncture of the membranes in such cases, but he believes it has its place. In the past however labour had certainly been induced unnecessarily; greater knowledge was needed of the conditions under which it should be done. The masters of the Coombe and of the National Maternity Hospital both appeared to concur, but several who took part in the discussion questioned whether induction of premature labour for supposed disproportion was ever justifiable in the primipara. Dr. Davidson thinks that external pelvimetry will often draw attention to cases of contracted pelvis, and that internal pelvimetry, combined with an estimate of the weight of the infant, will help materially to strengthen the judgment regarding the prognosis for delivery. There is much difference in the recourse to Cæsarean section at the three hospitals. It was done 26 times at the Coombe, 2·2 per cent. of all deliveries; 41 times at the Rotunda, 0·6 per cent. The master of the Rotunda would have it resorted to only when the indications are absolutely clear; under the very best possible circumstances the risk is at least three times greater than that of vaginal delivery under the worst possible circumstances—a very pointed warning. Eclampsia was treated upon the lines that have long been advocated in Dublin and the mortality remained at about the level of 10 per cent. At the Coombe the practice continues of allowing delivery without any attempt to save the perineum.

A YEAR'S SURVEY OF CRIME

OFFICIAL figures about crime are generally soothing. If the tables register decreases, we can share in the credit due to a better world. On the other hand if crime is going up, we can still believe that things are not really worse—it is only that our excellent police are more alert in bringing rascals to justice. Part of the soporific effect produced by official statistics may be due to other causes. The annual volume for England and Wales, just published (Cmd. 4977, 3*s*. 6*d*.), gives us the figures for 1933—a receding period in which our interest is diminishing; will the Home Office never manage to catch up this twelve months of arrears? There is something unexhilarating too about the way in which the information is presented. An introduction of 13 pages is all too short and too jejune. The speculative comments which were prefaced to these annual volumes a few years ago have apparently been cut down in the interests of economy. We could better have spared the tedious 40 pages which tabulate all the possible crimes we can commit; the curious can cull this information from the statute-book or from manuals on the criminal law. The very figures themselves refuse to be sensational. Take, for instance, the steadiness of inquest statistics. In 1928 (the first full year after the amending Act of 1926) there was a total of 31,553; in 1933 it was almost unchanged at 31,669. Here, however, one fact of interest can be extracted. The post-mortem examination without inquest, made possible by the 1926 Act, is proving its value. For every six such cases in 1928 there were eight in 1933. There has been no conspicuous rise in non-jury inquests in the same period.

Crime as a whole fell in 1933 below the figures for 1932 which was in some ways a peak year. If the experts rightly relate this improvement in part to the decrease in unemployment, it is yet notable that attempted suicide is still going up. Last year's figure was a record for this offence. In the volume for 1930 we were officially told that in recent years it was not the practice to prosecute for attempted suicide unless special reason existed—e.g., to keep the offender in custody for his own protection. Since 1925 a person charged with this offence can be dealt with summarily instead of being sent for trial. This change may have increased the number of cases brought to the knowledge of the police. We observe that the only other offence where discretionary latitude exists is that of Sunday trading. Over 30,000 persons were found guilty of it in 1933, but a footnote to the table tells us that in most districts it is not the practice to prosecute for Sunday trading: in the exceptional areas, it seems, a few traders cheerfully run the risk of repeated fines. The murder figures are, as usual, steady. Of the 58 persons arrested on this charge in 1933 one committed suicide on arrest and another before trial; one was certified insane before trial; five were found insane on arraignment, and sixteen were found "guilty but insane." We get a hint here of the price we pay for the defects in our system of diagnosing and treating mental disease. If we turn to the figures of criminal lunatics detained on Dec. 31st, 1933, we find that 439 were so detained where the charge was murder; no fewer than 104 of these had then been in institutions like

Broadmoor for 20 years and over. The corresponding figures for attempted murder, felonious or malicious wounding, rape, indecent assault, and other offences make equally lamentable reading.

The criminal statistics of the year as a whole must be correlated with the changes of population. If juvenile delinquency is increasing, it must be remembered that there were more boys and girls between the ages of 10 and 14 to commit offences. Even when this allowance is made, it is sad to find that children and young persons are becoming more ill-behaved. If the year 1933 is compared with the year 1911 and the number of indictable offences is adjusted to the relative totals of population, we find that a figure of 288 (per 100,000) for boys and girls under 16 charged with indictable offences has leapt up to 370 in 1933, whereas the corresponding figure for older persons has dropped from 232 in 1911 to 189 in 1933. In part this increase may be due to the development of juvenile courts and to the growing recognition of the fact that the treatment of the juvenile offender is dominated by regard for his own best interests. The increase in young persons' offences is largely connected with charges of larceny, which may often be trivial enough. There is also an increase in sexual offences committed by young persons from the age of 16 to 21. One happy feature repeats itself in 1933—namely, the comparative good behaviour of the female sex. Whether it be due to natural virtue or to the sheltered life, the proportion of offenders is nearly eight times higher among males than among females.

ECLAMPSIA AS AN ENDOCRINE DISORDER

In spite of a vast and ever-swelling literature, the cause of eclampsia and the pre-eclamptic toxæmia of pregnancy remains obscure. This is not for lack of speculation. "Theories" of eclampsia and appropriate régimes of treatment are numerous enough, though none can yet hold its own on a basis of direct evidence. In particular, attempts to demonstrate that the disease is an expression of disturbed endocrine balance have multiplied of late years, and attention has been directed naturally to the pituitary. Evidence for and against the idea of an over-secretion of the pressor hormone of the posterior lobe was summarised in these columns just a year ago,[1] when we concluded that the hypothesis must at present be regarded as unproven. More recently attention has been transferred to the anterior lobe of the gland and some observations of G. Van S. Smith and O. W. Smith [2] deserve careful attention. These workers have investigated the distribution of prolan and œstrin in various tissues and fluids during normal and abnormal pregnancy. In normal pregnancy, they say, the prolan content of blood and urine rises during the early months, falls sharply at the fourth month, and thereafter remains fairly constant; whereas in toxæmia the level remains high even when symptoms do not develop until the sixth or seventh month. The œstrin content of the blood and urine, on the other hand, displays a steady rise throughout normal pregnancy, reaching a peak at term, and in cases of toxæmia the rise is often delayed. The next step in the Smiths' investigation was to analyse the placenta for the same hormones. Here also they find that there is an excess of prolan and a paucity of œstrin in cases of toxæmia. And they conclude that it is the placenta rather than the pituitary which produces the extra prolan.

The immediate value of these experiments lies in the fact that they suggest a means of detecting toxæmia before clinical symptoms appear, though it remains to be seen whether such a test will prove a practical proposition. The underlying significance of the observations is another matter, and it is not likely to become apparent until more is known about the nature and functions of the various hormones concerned. So far at least six factors—namely, prolan A, prolan B, œstrin, progestin (corpus luteum principle), oxytocin, and vasopressin—are known to play some part in the sexual cycle and pregnancy. Even if no further principles are discovered an equation involving six factors, none of which is constant, is not easily solved. The present observations will no doubt be tested and extended in due course, but meanwhile they strengthen the suspicion that eclampsia may one day be recognised as an endocrine disorder.

THE CALCUTTA TROPICAL SCHOOL

Lieut.-Colonel R. N. Chopra's report for 1934 of the Calcutta School of Tropical Medicine records the retirement of several European officers who have served the school well. Lieut.-Colonel H. W. Acton has since died after a long illness, and his death excites the keener regret for the reason that his fertile brain was still young and vigorous. He had been director since 1928, rendering services of equal distinction as teacher, administrator, and research worker. He has left as a legacy to the school the one and only department of medical mycology in India. The imperial serologist, Lieut.-Colonel R. B. Lloyd, has also retired and Dr. Ernest Muir has severed an association of fifteen years long during which his unselfish and painstaking work on leprosy has achieved a large measure of success. His latest work on the leprolin tests has shown it to be of importance in prognosis and treatment. The report contains a running record of special investigation in many directions. The epidemic dropsy which has been so fatal in Bengal and Bihar during this century seems to be yielding up its secret, for a gram-positive spore-forming bacillus, isolated from the stools in many cases, has been found to agglutinate in high dilution with the sera of convalescent patients. Similar organisms have been recovered from diseased rice, and it is more than probable that the toxic products are elaborated mainly in the rice or in the presence of rice. In Colonel Chopra's department a further study has been made of carbarsone,[1] an organic arsenical preparation which is non-toxic and renders the stools free from amœbæ in three to four days. A similar drug prepared in India and called amibiarson has given almost as good results in 40 cases,[2] the ratio of probable cures to failures being 5 to 1. The action of atebrin on monkeys infected with malaria has been further studied and some light on the transmission of kala-azar has been thrown by the observation that hamsters infected through the bite of the sandfly may not show evidence of infection for eighteen months or more. There is a wide demand from hospitals in Calcutta for various bacteriophages prepared in the school; the perplexing thing about choleraphage is that one year it may agglutinate most of the strains of vibrio isolated and another year may not. It seems that

[1] THE LANCET, 1934, ii., 490.
[2] Surg., Gyn., and Obst., July, 1935, p. 27; August, 1935, p. 175.

[1] See THE LANCET, 1933, ii., 663.
[2] Chopra, R. N., Sen, B., and Sen, G.: Indian Med. Gaz., June, 1935, p. 324.

either the cholera vibrio or bacteriophage must be "educated" to act one upon the other, and its true value awaits the next epidemic season. The report is a milestone in the progress of tropical research which can be obtained gratis from the superintendent of the Government Press at Alipore, Bengal.

THE PROGRESS OF CREMATION

IT is now just fifty years since the first public crematorium in this country was opened at Woking, largely owing to the enthusiasm of Sir Henry Thompson who acquired in 1878 the ground on which it stands. There are now 28 crematoria in this country. During the year 1934 the municipalities of Birkenhead, Newcastle-on-Tyne, Plymouth, and Stockport opened their own crematoria, Blackpool has since done the same, while Kent has acquired a suitable site of twelve acres at Charing. But progress is slow and the total number of cremations during 1934 was only 8337, an increase of 866 on the previous year. An important new move has now been made by the Cremation Society which obtained legal authority on July 8th last to conduct the business of industrial assurance. In Sweden, Czecho-Slovakia, and Germany, where cremation is more popular than it yet is here, a scheme of insurance has helped to create a cremation-mindedness among the community. Following this example a small weekly contribution over a period of years will qualify for associate membership of the society with the right to cremation at death anywhere in Great Britain. The weekly contribution is only 4*d.* for five years if the proposer is under 45, and 3*d.* if he is under 18. An associate may insure further against funeral expenses up to a maximum of £20. The Cremation Society is also promoting the formation of a National Council for the Disposition of the Dead which has now come into being and is making its first objective the State registration of undertakers which will pave the way to the revision and codification of the law of burial. The Cremation Society would like to remove the popular impression that cremation is expensive. Life membership of the society costs five guineas and covers the cost of cremation at death at any crematorium in Great Britain. The address of the society is 23, Nottingham-place, London, W.1.

DANGEROUS DRUGS TRAFFIC AT HOME

THE annual report of H.M. Government to the League of Nations for the year 1934 on the traffic in opium and other dangerous drugs deals with the question from a national rather than an international point of view. It is accordingly largely negative in much that it has to relate. No opium, coca, or Indian hemp are cultivated in Great Britain or Northern Ireland. There has been nothing new in legislation or administration nor any official publication during the year under review, except that a branch of the Home Office has been set up to deal with all matters relating to dangerous drugs. It is again reiterated that addiction to narcotics is not prevalent in the United Kingdom, no difficulty has been encountered in applying the Hague and Geneva Conventions, and no important cases of illicit traffic have come to light. The limitation of the internal manufacture of narcotic drugs has been applied in accordance with the Convention of 1931, though some difficulties have been encountered in securing compliance from countries outside the British Empire in regard to requests for the export to their governments of heroin. Five firms only are licensed for the manufacture of medicinal opium in Great Britain, two only for morphine and heroin, both in Scotland, and one for cocaine at Dagenham (Essex). Prepared (or smoking) opium, which is still exported from India and consumed in British colonies in the Far East, is a prohibited possession in this country and its detection punished by heavy fine or imprisonment, while the seized contraband is destroyed. During 1934, 86 persons were proceeded against under the Dangerous Drugs Acts; in the case of 69 convicted 41 were fined, in 13 cases more than £5, and 28 were sentenced to imprisonment, two of them to penal servitude for three years.

Much information may be gleaned from the statistical tables appended to the report. More than 50,000 lb. of raw opium were imported in the year, mostly from Asiatic and European Turkey. The chief import of cocaine was from the Straits Settlements. 28,844 lb. of raw opium were exported, chiefly to the United States. Of morphine, its salts and preparations, 14,317 oz. left this country, chiefly for Canada, Australia, and India; the consignment to China was only 781 oz., or more than 200 oz. less than in 1933. The total exports of heroin were less, 2099 oz. in all, chiefly destined for Australia, Canada, and South Africa. Of cocaine again exports were less than in 1933, Canada, Australia, South Africa, and India being the chief recipients. Of 71,868 oz. of morphine produced in the licensed factories 24,519 oz. were used for conversion into codeine and 12,651 oz. in the preparation of heroin.

CHANGES IN GERMAN CRIMINAL LAW

IN Germany criminal law is changing rather rapidly under the Nazi régime with its bent towards racial improvement, and Dr. V. Müller-Hess, who is director of the Berlin Institute for Legal and Social Medicine, has been at pains to set out [1] how these changes are likely to affect medical practitioners. Operations with the patient's consent are legal provided morality is not offended. Abortion is now a criminal offence and anyone advertising or displaying abortifacients to the general public is liable to two years' imprisonment, a provision which does not apply to abortifacient preparations advertised in medical journals. Where a crime is suspected and an operation is considered necessary to verify the facts it may be performed even against the patient's will—e.g., a blood-alcohol test (Widmark) in proof of drunkenness of the driver in a motor accident, curettage in post-abortion or post-partum cases. Where a person is held to be not responsible for a criminal act through insanity or the effects of alcohol or drugs the punishment is mitigated but he is detained in an institution if the public safety demands it. This plea is therefore no longer put forward for the defence as if the prisoner be acquitted it might lead to his detention. As a measure for reducing the number of persons of low moral standard from whom criminals are to a large extent recruited sterilisation is now recommended. Thus a man of 21 years or over can be castrated if his offence shows him to be a dangerous moral criminal; should sexual perversion lead to homicidal risk castration becomes a means of ensuring the public safety. Dr. Müller-Hess and his colleague, Prof. F. Wiethold, admit that to decide whether castration should be done is a difficult and involved problem; many doctors hesitate to give their opinion on this, for like the death sentence it is final. The whole science of sex must, they argue, be brought into consideration

[1] Münch. med. Woch., 1934, lxxxi., 1679 and 1729.

as the secretions of ductless glands other than the testes are responsible for the sexual impulse. The excitable and unbridled moral criminal becomes phlegmatic and peaceful after castration—half of those castrated are said to be cured of their criminal inclinations—but the ability for work is diminished. Castration should not be applied to sexual offences committed under the influence of alcohol. Moral offenders, it is believed, stand in great fear of castration, and the new law is acting as a deterrent. The position has been made a little easier for German practitioners by a resolution passed a fortnight ago at the eleventh International Penal and Penitentiary Congress held in Berlin. This resolution called attention to the "favourable preventive-therapeutic results" achieved in cases with a criminal tendency and recommended an amendment of the laws of all countries so as to facilitate castration upon demand or with the consent of the person concerned. This resolution is naturally more binding on the German than on the foreign delegates, who were in a minority, especially as the president of the congress refused a request for voting by nation. Another resolution, which has received less notice in the German press, was passed disapproving the application to the sterilisation of criminals of principles different from those of eugenic sterilisation in general.

HYPOTHALAMIC FUNCTION

OF late years no part of the brain has attracted more attention than the hypothalamus. While it has long been known that stimulation of this part of the nervous system evokes pupillary dilatation, rise of blood pressure and contraction of the bladder, the more precise delimitation of the centres responsible for such reactions has awaited the evolution of a more delicate method of exploration than those formerly employed. Such a method is provided by the Horsley-Clarke apparatus. This is essentially a rigid frame that is fitted to the animal's head and supplied with graduated bars so arranged that the precise site in the brain of a delicate needle-like electrode can be determined. Using this apparatus on cats under Nembutal anæsthesia, Ranson, Kabat, and Morgan[1] have systematically explored the hypothalamic region. They obtained a pronounced sympathetic response on stimulating

"the lateral part of the hypothalamus in the region occupied by the medial forebrain bundle even up to the edge of the internal capsule. ... Posteriorly the reactive field is concentrated in a narrow zone dorsolateral to the mammillary body and across the midline in the supramammillary decussation. From this point the reactive column can be traced back into the mesencephalon. We believe that an important pathway descending from the hypothalamus runs caudalward through this region close to the mammillary body and undergoes a partial crossing in the supramammillary decussation."

Stimulation of this area inhibited intestinal peristalsis, and in no part of the hypothalamus could a converse effect be produced. They could get no evidence of a parasympathetic centre in the hypothalamus, and here they differ from J. Beattie who holds that such a function is exerted by the "supra-optic-posterior pituitary-tuber cinereum complex."

Elsewhere Dr. Ranson[2] reports that he and his collaborators have found in addition that lesions placed so as to interrupt the continuity of the hypothalamico-hypophyseal tracts, which pass from the supra-optic nuclei to the posterior lobe of the pituitary, will produce symptoms of diabetes insipidus. But it is essential that the lesions should be bilateral and symmetrical. Post-mortem investigation showed atrophy in both supra-optic nuclei and posterior lobe in all the 10 cats studied. It is noteworthy that these workers were not able to produce the picture of Fröhlich's syndrome by experimental hypothalamic lesions. A further point of interest is their observation that extensive injury to the region of the mammillary bodies causes catalepsy and somnolence. This work is being repeated on monkeys, and it will be interesting to see if similar results should be obtainable in an animal so much more closely related to man.

[1] Arch. Neurol. and Psychiat., 1935, xxxiii., 467.
[2] Weir Mitchell oration, Trans. Coll. Phys., Philadelphia, 1934 (4th ser.), ii., 222.

FOOD STORAGE

THE report[1] of the Food Investigation Board for 1934 deals chiefly with how to preserve foods brought from long distances. The discovery that beef can be stored for 60 to 70 days in a chilled state by enriching the air of the store with carbon dioxide has made it practicable to bring beef to this country from Australia and New Zealand, and the first shipment has arrived here in good condition. The interests of the home producer are being cared for by a further development of gas storage for the preservation of apples; there is now storage capacity for about 400,000 bushels. The herring industry is being promoted by experiments at the Torry Research Station, which have shown that herrings frozen at the usual temperature of minus 5° F. would still make good kippers after at least five months' storage at that temperature. Home-caught fish may thus be available all the year round. Certain kinds of fruit have been found to keep free from mould for a longer period if wrapped in iodised paper; some varieties however resent this treatment. The use of iodised wrappers is accordingly being tested under commercial conditions. Those who retain the juvenile habit of eating apples, peel and all, may claim a scientific warrant for so doing, as it has been found that in Bramley's seedling the vitamin-C content increases as the skin is approached, and is six times as great in the peel as in the core. The vitamin potency of rosy apples is more than twice that of green ones. Apples, it seems, do not lose vitamin potency either on storage or when canned. Experiments on the addition of artificial vitamin C to foods such as runner beans and other vegetables which do not naturally contain it may lead to the production of useful antiscorbutic foods. The report contains much else of interest. To the work of the Board is largely due the varied selection of foods which we now enjoy at all times of year.

THE King has appointed Mr. James Learmonth, regius professor of surgery in the University of Aberdeen, to be one of the honorary surgeons to His Majesty in Scotland, in succession to Sir John Marnoch, who has been appointed an extra surgeon to His Majesty in Scotland.

Dr. M. Abdy Collins, medical superintendent of the Kent County Mental Hospital, Chartham, has been elected president of the Royal Medico-Psychological Association, in succession to Dr. Reginald Worth. He takes office next July when the Association holds its annual meeting at Folkestone.

[1] H.M. Stationery Office. 4s.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXVII.—PROGNOSIS OF MALOCCLUSION OF THE TEETH

MALOCCLUSION of the teeth includes a wide variety of conditions differing greatly in their type, their effect on facial appearance, and their causation. Our knowledge of the ætiology of many forms of malocclusion is still conjectural, so that a correct prognosis is often difficult to make. The following factors, among others, must be considered by the dental surgeon undertaking the treatment of malocclusion of the teeth.

(*a*) If the child is seen at an early age, is the malocclusion likely to decrease with the eruption of the permanent teeth or will it become accentuated?

(*b*) If the malocclusion is associated with habits such as thumb-sucking or some pathological condition like post-nasal obstruction, does the success of the dental treatment depend on the removal of the associated condition?

(*c*) Where alternative methods of treatment appear possible, can a forecast be made of the results of either? For practical purposes this involves a decision between retaining all the teeth and making room by expanding the jaws or providing space by extraction of one or more permanent teeth. A sound judgment is here of fundamental importance, for a method of treatment once embarked upon cannot easily be abandoned if the results prove unsatisfactory. If all the teeth are retained and room made by expansion, a subsequent relapse may be irremediable. If teeth are extracted as a means of making space, this method of treatment is equally irrevocable. Furthermore, the treatment may involve several stages differing in their objects, each of which is contingent on the success of the preceding stage. It is desirable, therefore, to be able to forecast the result of each stage as an essential link in the chain of treatment.

(*d*) If the teeth have been brought into satisfactory alignment, will the corrected occlusion remain stable, or is there any risk of relapse?

Natural History of Malocclusion

In order to be able to answer these questions, even with reserve, it is essential to be familiar with what may be called the natural history of malocclusion: the onset of the various types and the changes in form or degree which may occur during the growth of the jaws and teeth. Generalised forms of malocclusion affecting many teeth and involving an abnormal relationship of the dental arches to each other, are dependent on abnormal bone growth. Modern investigations have shown that the factors responsible occur in early life and that they express themselves in the form of an abnormal dentition correspondingly early. Minor forms of malocclusion affecting a few teeth may be due to purely local factors such as the persistence of some habit; the presence of supernumerary teeth; injury of disease of a deciduous tooth affecting its permanent successor, and so forth. But these forms of malocclusion are of lesser importance, and the fact that their cause is obvious makes the prognosis comparatively easy. Limiting consideration to serious types of malocclusion affecting the jaws as a whole, we can divide their progress into five stages.

4–6 *years.*—At about the age of four to five the spacing of the deciduous incisors normally takes place. This is due to bone growth, and it allows room for the eruption of the larger permanent incisors. If this spacing does not occur, although the milk teeth may be evenly aligned, there will be insufficient room for the permanent incisors, and thus a potential irregularity exists. Some bone growth may occur later but more frequently a progressive crowding of the permanent teeth takes place during their eruption. If the milk teeth themselves are crowded, even if the crowding be slight, then a marked degree of irregularity of the successional teeth may confidently be predicted. Malocclusion involving an abnormal arch relationship, such as protrusion or retrusion of the upper or lower jaw, may be present in the deciduous dentition. Such a condition will undoubtedly be perpetuated in the permanent dentition in an aggravated form. Here we have the answer to the first question. Malocclusion, whether actual or potential, in the deciduous dentition if left untreated will not as a rule improve but rather progress with the eruption of the permanent teeth. The condition of open bite (an elliptical gap between the upper and lower incisors) is not uncommon in the deciduous dentition, and is often, though not invariably, associated with thumb-sucking or the use of a dummy comforter. In the permanent dentition this gap tends to disappear, but the associated protrusion of the upper incisors will probably be perpetuated. It cannot be said that the correction of thumb-sucking or mouth-breathing will in itself effect a cure of the associated irregularity of the teeth, but it will remove one of the adverse factors and thus improve the prognosis.

6–9 *years.*—During the eruption of the permanent incisors which takes place between the sixth and ninth years, these teeth must take the place formerly occupied by the smaller milk teeth. If spacing has not occurred a malocclusion faintly foreshadowed in the temporary dentition will become a definite irregularity.

11–12 *years.*—The degree and character of malocclusion affecting the permanent incisors may undergo a change for the worse during the period of eruptive activity of the canines, which normally occurs between the ages of 11 and 12 years. It is probable that the first premolars will be present Thus the canines must erupt into a gap between the incisors and first premolars. If the arch is narrow or there is crowding of the incisors there will not be enough room for the canines. These teeth may be forced outwards to resemble miniature tusks; alternatively, their development and movement in the bone prior to eruption may cause them to press on the lateral incisors and tilt these teeth outwards.

12–13 *years.*—The active development of the second or twelve-year-old molars exerts a pressure on the end of the arch which may push forward the anterior teeth. Any degree of crowding present may thus be made worse. Sometimes a slight degree of crowding not previously severe enough to warrant treatment may be turned into a positive irregularity by the eruptive force of the second molars. If treatment has been carried out with apparently satisfactory results by means of an expansion appliance, relapse may occur at this stage. If, on the other hand, treatment has not been instituted on the grounds that the previous condition did not warrant intervention, then the most favourable period for commencing treatment has been passed and the chances of producing a satisfactory result will be correspondingly lessened. In deciding how long retention of a corrected occlusion should be maintained, attention must be paid to this factor, and any appliance used for retaining the teeth in place should always be worn until the second molars are well in position.

From 17 years onwards.—The time of eruption of the third molars or wisdom teeth is very variable. But from about 17 years they are in active growth and their eruption may occur at any period after this age. It is only recently that the third molars have been recognised as factors in orthodontics. In the past many treated cases have relapsed because of the pressure of the wisdom teeth. Before giving a prognosis on the probable progress of malocclusion or on the permanence of the effect to be anticipated from treatment, radiograms should always be taken to ascertain the presence and position of the wisdom teeth. In estimating the amount of room required to accommodate irregular incisors and canines,

the dental surgeon must always remember the increasing pressure from behind, consequent on the development and eruption of both the second and third molars, as a factor of fundamental importance which affects the choice of treatment and the ultimate stability of the results obtainable. Similarly, a slight degree of crowding in a child of ten or twelve with its dentition complete for that age—i.e., with the permanent canines and second molars present—may become a marked irregularity a few years later when the third molars begin to approach their eruptive stage. Failure to recognise this possibility at an age when treatment is possible means that when the malocclusion becomes actual and obvious the child has passed the age when treatment is likely to be effective. On all grounds, therefore, it is of cardinal importance to ascertain the position of the third molars and to take this factor into account in making a prognosis both of the development of malocclusion and the results of orthodontic treatment

Results of Treatment

There are many different forms of malocclusion, but speaking broadly the choice of method resolves itself on a decision to move the misplaced teeth by various types of appliances or else to make room by the extraction of one or more permanent teeth. The problems of prognosis of the results of treatment may conveniently be illustrated by taking three characteristic forms of malocclusion.

1. *Superior protrusion*, where the deformity affects mainly the upper arch, and shows itself by a narrow arch, high palate, and prominent front teeth.

2. *Inferior retrusion*, in which the lower jaw is under-developed, the chin is receding, and there is an associated prominence of the upper incisors.

3. *Inferior protrusion*, in which the lower jaw is over-developed and the upper front teeth lie inside the lower incisors instead of overlapping them.

SUPERIOR PROTRUSION

Here the jaw is narrow; the front teeth slope forwards and the lower lip tends to lie behind them, thus making their prominence worse. The essential element in treatment is to push back the upper incisors and canines. In order to create the necessary space the upper arch must either be expanded by an appliance or else a pair of teeth, usually the first premolars, must be extracted. Both methods have their advocates, but it must be borne in mind that the real crowding in these cases is in the region of the roots of the teeth. Expansion is not really a bodily movement of the teeth, but rather a tilting of the crowns, with a relatively slight degree of movement in the all-important apical region. It is not difficult to push out the crowns by means of an appliance and to obtain what looks like a satisfactory result. But since the treatment rarely stimulates bone growth there is a risk that the teeth, though evenly aligned, may look a size too large for the face. Furthermore, the pressure from behind of the second and third molars, already referred to, may cause relapse in later life. There is a place for the treatment of these cases by expansion, but in my opinion it should be the method of choice only where the amount of room required is small, say 3 to 5 mm. If the space required is greater than this, then extraction of a pair of permanent teeth may give a better and more stable result. The removal of the first premolars allows the canines to fall back into place, and thus permits the retraction of the prominent incisors to be carried out easily. An additional benefit is that a gap is thus created in the chain of pressure from behind due to the development and eruption of the second and third molars, and one of the most potent causes of relapse is obviated. It is often wise to commence by expansion at about the age of 7 or 8, to see how the jaw develops and later on to extract the premolars when the canines are approaching eruption.

INFERIOR RETRUSION

In this condition, which appears to be getting more common, the defect is primarily in the mandible, which is under-developed. The method of choice is to try to bring the lower jaw forwards by means of a plate in the upper jaw, the front of which forms an inclined plane so that when the child bites the lower incisors impinge on the plane and the mandible is thrust forwards. The molars probably erupt more and come into a fresh occlusal relationship, thus stabilising the bite in the new position so that the forward position of the lower jaw, which is thus induced, becomes anatomically fixed. Another method which finds favour with many dentists is intermaxillary traction. This consists of arches fixed to the upper and lower jaws by bands cemented to the molars so that it cannot be removed by the patient. Elastic rings are fixed to the arches so that when the mouth is opened the tension of the elastics tends to pull the upper teeth back and the lower teeth forwards. Prognosis should be guarded. The treatment, though often effective, is to some extent empirical, and in a certain proportion of cases the lower jaw fails to come forwards and though the appearance of the chin is improved so long as the appliance is worn, when it is left out the condition relapses. If treatment is commenced at 8 years, and by the age of 11 years the lower jaw has failed to move forwards, it is improbable that the retrusion of the mandible will be corrected. This does not mean, however, that orthodontic treatment has failed completely. The associated protrusion of the upper incisors, which always exists in this condition, can be treated on the lines already described. There will be a material improvement even though the mandibular retrusion still remains. But while extraction of a pair of maxillary teeth is often an integral part of the treatment, extraction of lower teeth should never be done. Since the lower jaw is developmentally too small it would be a grave error to make it still smaller by the extraction of permanent teeth.

INFERIOR PROTRUSION

This condition is relatively rare. It is often inherited. It is, perhaps, the most difficult of all forms of malocclusion to treat; but in its severe forms it is so marked a deformity that an attempt should always be made to treat it, especially in a girl. The earlier the treatment is commenced the better is the prognosis. While the defect is primarily in the mandible it is not possible to diminish the size of the jaw except by surgical measures, which involve a serious operation. The surgical correction of inferior protrusion has been practised in America by Kazanjian, and in France by Dufourmentel, with satisfactory results. The possibility of utilising this method might be considered in exceptionally severe cases, but it can scarcely be regarded as a normal part of orthodontic treatment at the present time. The essential part of treatment is to push out the upper incisor teeth so that they lie outside the lower incisors, as in the normal jaw. Once this is done the lower incisors will retain the upper ones in place, while the latter will limit the possibility of the lower incisors moving still more forwards and thus increasing the malocclusion. A reduction in size of the lower arch should then be attempted by extraction of an incisor or a pair of premolars combined with the use of an appliance to retract the lower front teeth. The

best time to commence treatment is when the upper incisors begin to erupt, for a slight degree of force will then suffice to guide them into a normal alignment. The prognosis is reasonably good both as regards the actual treatment and the liability to relapse and it is usually possible to obtain an improvement, though a restoration to an anatomically normal relationship of the arches is unlikely. In some cases, however, the unknown factor which has led to an over-development of the mandible seems to be progressive, and despite all treatment the condition persists and gets worse. For this reason the prognosis should be cautious.

Orthodontic Appliances

Orthodontic appliances may be divided broadly into *fixed* and *removable* ones. The former cannot be removed by the patient and depend for their retention on bands cemented to various teeth. The latter are like dentures which can be removed at will and are held in place by bands or wires round teeth. Their efficiency depends on a good anchorage and effective leverage. Practically all movements of misplaced teeth can be effected by either fixed or removable appliances provided they are properly constructed. In some cases a fixed appliance is better as affording a more effective application of force to the teeth to be moved. In others, a removable appliance may be preferable; in many cases it may matter little which type is employed. Fixed appliances call for a higher degree of technical skill in their construction and are often more expensive. They are sometimes criticised on the grounds that their presence interferes with the hygiene of the mouth. But if they are properly made, and a reasonable degree of coöperation on the part of the patient can be assured, it is doubtful if a fixed appliance is inherently less cleanly than a removable one.

In complicated cases of malocclusion where movements of individual teeth are required, a fixed appliance, which gives a firm anchorage and allows of an accurate apposition of force to the teeth to be moved, is often better than a plate which is less secure and more liable to move. But fixed appliances are delicate and easily broken, while their repair may be difficult. Since it often happens that children undergoing treatment spend a large part of their life at boarding-schools, the dentist may find it wise to use the simpler method of a removable plate as less likely to be broken, though possibly less mechanically effective. The choice of appliance must always be left to the dental surgeon in charge of the case, for he alone can decide on the method of treatment and adopt the apparatus most likely to bring about the desired result. Provided that the dental surgeon possesses the experience and skill to justify him in undertaking orthodontic treatment, the prognosis should not be materially affected by the particular type of appliance he employs.

Prognosis in Treated Cases

Orthodontic treatment is likely to be tedious; moreover, it involves a considerable interference with a child's life, may clash seriously with its education, and is often costly. Treatment is usually sought because of the ugly appearance of irregular teeth; in a girl the æsthetic defect may attract little attention until adolescence. Then it may be a serious blemish, though at that age little can be hoped from treatment. Early diagnosis is essential and involves recognition of the ultimate progress of the condition if left untreated. The ideal age to commence treatment is about eight, when the permanent dentition is making its appearance and the child is old enough to give the necessary coöperation. The parent has a right to know and the dental surgeon will be expected to say whether there is a good prospect that treatment apparently successful at the age of 12 will remain so in later life. It is not always easy to prophesy, and even the most experienced practitioner may find cases which relapse unaccountably. But the dental surgeon who selects carefully his method of treatment, with due regard to what the various appliances can accomplish and remembers that it is the position of the roots in the bone which matters rather than the crowns of the teeth, should be able to make a reasonably sound prognosis. If he visualises the changes likely to occur during the phases of growth and plans his treatment with the idea that room must be made not merely for those teeth which are irregular, but also for the entire dentition, he will not run the risk of finding a "good" result relapsing through subsequent growth changes. Much orthodontic treatment has failed in the past, and doubtless will continue to fail, because operators have not realised that while it is comparatively easy to move teeth with the delicate but powerful appliances now available, relapse is almost inevitable if there still remains a condition of crowding in that part of the jaws which contains the roots of the teeth.

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PEPTIC ULCER OF MECKEL'S DIVERTICULUM

THIS rare cause of severe intestinal hæmorrhage is discussed in a paper by Crols and Van Hasselt in the *Nederlandsch tijdschrift voor geneeskunde* (1935, lxxix., 3637).

Their own patient was a boy aged 3½, and the history was that four days previously he had complained of abdominal pain, which passed off after the bowels had moved. The next day there was another similar attack of pain, followed on this occasion by the passage of a large quantity of dark red blood, and later of a further quantity of tarry blood. On admission to hospital the child was very pale, with a small and rapid pulse. Nothing abnormal was found on abdominal examination except a slightly tender spot to the right of the umbilicus. The rectum was full of blood clot; no polyp or intussusception could be felt. As profuse bleeding continued, immediate operation was performed, and a Meckel's diverticulum, distended with blood, was removed. It was found, on microscopical examination, that the mucous membrane lining the distal part of the diverticulum was of a similar type to that of the fundus of the stomach, including many oxyntic cells. The ulcer from which the bleeding had come was situated in the basal part of the diverticulum—i.e., in the part lined with mucosa of intestinal type. It measured about 4 mm. across, and an open vessel could be seen in the base, which was formed by fibrous tissue infiltrated with round cells, the muscularis having completely disappeared. The patient made a good recovery.

The authors point out that a number of similar cases of ectopic fundus epithelium in Meckel's diverticulum have now been described; they compare the occurrence of a peptic ulcer here to that of a gastro-jejunal ulcer after gastro-enterostomy. Cases of hæmorrhage from, or perforation of, the ulcer have been reported, mostly in young children, and almost always in males. The differential diagnosis must be made from intussusception, rectal polyp, and blood diseases such as purpura and the like; in cases with perforation, from acute appendicitis. If, as sometimes happens, perforation is preceded by hæmorrhage, this should suggest the possibility of an ulcer of Meckel's diverticulum. Intussusception is ordinarily seen at an earlier age than the much rarer peptic ulcer of the diverticulum.

SPECIAL ARTICLES

WEIL'S DISEASE AMONG COAL-MINERS

IN NORTHUMBERLAND AND DURHAM

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Leptospiral infection is probably commoner in the British Isles than might be supposed from the number of cases on record. Since Manson-Bahr's [1] case in 1922 there have been only three satisfactory accounts of outbreaks in this country. Buchanan [2] in 1927 described 31 cases in the Edinburgh area of which 17 were miners. The mortality in his series was 25 per cent. He found virulent leptospiræ in the slime and water in coal-mines and he was able to demonstrate leptospiral infection in about 37 per cent. of wild rats. Hamilton Fairley [3] in 1934 described 2 fatal cases of Weil's disease in London sewer-workers and obtained positive agglutination reactions from 8 other sewer-workers who had suffered from jaundice from seven months to twelve and a half years previously. Davidson [4] and others in 1934 reported a series of 19 cases from Aberdeen, 12 of the patients being fish-workers; the mortality was 31·6 per cent. Halsted [5] described another case in a London sewer-worker and Wolstencroft [6] an isolated case in a canal-worker. Alston and Brown have recently attempted to determine the degree of exposure to risk of sewer-workers and to explore the possibility of prevention by vaccination and other methods.[13]

The best recent account of Weil's disease is that of Schüffner [7] who describes 452 cases from Holland. Most of them occurred in bargemen, fishermen, and slaughterhouse workers; others followed immersion in canals. The mortality in this series was only 10·2 per cent. This low figure is accounted for by the large number of proved cases (60 per cent.) which showed no jaundice and none of which died. The mortality among jaundiced cases was roughly 25 per cent., a figure which is directly comparable with those of the British workers who dealt only with jaundiced cases.

It is generally agreed that leptospiral infection in man is a result of contact with fresh water which has become contaminated by the excreta of infected rats. The portal of entry of the leptospira is probably through small abrasions, and Schüffner [7] from experiments with guinea-pigs showed that the organism has difficulty in penetrating the intact epidermis. He also mentions an epidemic in Lisbon which was spread by drinking water. Man-to-man infection is so rare as to be negligible. Estimates of the carrier-rate for leptospiræ in rats vary. Coles [8] found infection in 9 per cent. of rats from Bournemouth, Foulerton [9] obtained 4 positive results from 101 London rats, while Stevenson [10] also working with London rats found leptospiræ in 30 per cent. Cookson [11] has found leptospiræ in one rat from a Northern colliery in which cases of jaundice had occurred.

The heavy mortality of the more severe form of Weil's disease makes it necessary that more attention should be paid to preventive measures directed against rats and moisture in places where there is danger of incurring infection.

The Present Series

During the last two years we have observed 12 cases of severe jaundice occurring in miners in Northumberland and Durham, in 9 of which we have been able to establish the diagnosis of Weil's disease either by guinea-pig inoculation of blood and urine or by the agglutination reaction which Schüffner [7] considers to be proof positive. Four patients died, giving a mortality of 33 per cent. We have not seen in hospital any cases of Weil's disease without jaundice, but we think it not unreasonable to assume in view of Schüffner's 60 per cent. of unjaundiced cases that many mild attacks of the disease must have escaped notice.

CLINICAL FEATURES

Incubation period.—Schüffner [7] found an average incubation period of 10·3 days. As all our patients were working up to the day of onset and with one exception gave a history of working daily in wet seams it was impossible to determine the date of infection.

Mode of onset.—Lassitude and malaise were present at the onset in all cases. Vomiting occurred in 9 and headache in 7 cases. Abdominal pain was present in 5 and pains in the joints and back in 4. Two patients complained of shivering, 4 were constipated, and 2 had diarrhœa. One patient became deaf and complained of dimness of vision. In one case (No. X.) anuria preceded the appearance of jaundice.

Jaundice appeared 2–9 days after the onset, the average interval being 5 days.

Hæmorrhages.—Except in two cases there was some form of bleeding. (See Table.)

Fever was very variable. Six cases were apyrexial throughout and four of these were fatal. Primary and secondary fever occurred in two cases and in each case the secondary fever was accompanied by rigors. One other case which had no fever on admission exhibited a typical secondary rise while in hospital. Three other cases showed primary fever only. The highest temperature recorded was 103° F.

Renal findings.—A striking feature of three of our cases (Nos. X.–XII.) was a very high blood-urea. Case X. had suppression of urine for 36 hours and in Case XI. there was said to have been some diminution of urinary output before admission. No history of anuria was obtained in Case XII., but the patient passed only 10 oz. of urine in the twenty-four hours between admission and death. In no other case was any diminution of urinary output noted. Albuminuria was present in 10 cases but was heavy in only 6. It is worthy of note that in Cases XI. and XII., which showed very high blood-urea figures, only a trace of albumin was found. For further details the reader is referred to the individual case reports.

Uræmia in Weil's disease has long been recognised on the Continent. Georgopoulos [12] in 1933 reviewed the prevailing opinions on the subject. He quotes the French writers as laying great stress on increased urea-production, but considers that there must be considerable impairment of renal function in addition in spite of the well-known fact that the renal lesions

Case.	Colliery.	Jaundice. B. = Units bilirubin. P. = Phosphatase units.	Hæmorrhages. Occ. bl. = Occult blood in fæces.	Nephritis. B.U. = Blood-urea in mg. per 100 c.cm.	Bacteriological findings. g.p. = guinea-pig.			Result.
					Blood.	Urine.	Agglutination.	
I. ..	A.	50 B. 9·4 P.	Epistaxis. Occ. bl. +.	No albumin.	—	No lep. found.	Pos. up to 1/300.	Relapse. Recovery.
II. ..	A.	52 B. 5·5 P.	None.	Albumin +.	Neg. g.p.	No lep. found. Neg. g.p.	,,	,,
III. ..	A.	22·5 B. 8·7 P.	Petechiæ.	Albumin trace.	—	Pos. g.p.	—	Recovery.
IV. ..	A.	16 B.	? Hæmatemesis.	No albumin.	Neg. g.p.	Neg. g.p.	Pos. up to 1/300.	,,
V. ..	A.	+	Petechiæ. Occ. bl. +.	Albumin +.	—	—	—	Died.
VI. ..	C.	115 B. 8 P.	Petechiæ. Hæm'ic herpes. Occ. bl. +.	,,	Neg. g.p.	No. lep. found.	—	,,
VII. ..	A.	40 B. 8·2 P.	Hæm'ic herpes. Occ. bl. +.	,,	,,	Neg. g.p.	Pos. up to 1/1000.	Recovery.
VIII. ..	B.	+	Petechiæ. Epistaxis. Occ. bl. +.	,,	Pos. g.p.	Pos. g.p.	—	,,
IX. ..	B.	+	Epistaxis. Occ. bl. +.	Albumin trace. B.U. 85.	Neg. g.p.	Pos. g.p.*	Pos. up to 1/1000.	Relapse. Recovery.
X. ..	D.	18 B. 10·6 P.	Epistaxis. Occ. bl. +.	Anuria. Albumin + + +. B.U. 285.	,,	Neg. g.p.	Pos. up to 1/3000.	Recovery.
XI. ..	A.	40 B.	Epistaxis. Petechiæ. Hæmatemesis.	Albumin trace. B.U. 387–600.	Pos. g.p.	Lep. present. Neg. g.p.	—	Died.
XII. ..	E.	46 B.	Petechiæ.	Albumin trace. B.U. 567.	Neg. g.p.	—	—	,,

Lep. = leptospiræ. * g.p. died with jaundice but no leptospiræ found.

in Weil's disease are often comparatively trivial and mainly consist of degenerative changes in the collecting tubules. This view seems to us to be reasonable and is supported in our Cases X. and XII. by definite impairment of water-excretion. In Case XI. at a time when the blood-urea stood at 630 mg. per 100 c.cm. the concentration of urea in the urine was 1·64 per cent.

In no case was there any œdema or rise of blood pressure.

Cerebro-spinal fluid.—In two cases (Nos. IV. and XI.) lumbar puncture was performed and the cerebro-spinal fluid showed, in addition to bile staining, a slight increase in protein and a considerable lymphocytosis. No leptospiræ were found. We have found no record of changes in the cerebro-spinal fluid in the literature of Weil's disease.

CASE RECORDS

I

Colliery A. A. B., aged 27. Admitted July 7th, 1933; discharged August 5th. Eight days before admission he complained of chill, headache, and lassitude. Jaundice appeared on the seventh day and was accompanied by dimness of vision and slight deafness. Also complained of epigastric pain and vomited twice. Worked in damp rat-infested seam.

Admission state.—Temp., 97·9° F.; pulse-rate, 72; intensely jaundiced and drowsy; papular non-hæmorrhagic rash generally; tenderness and rigidity below right control margin; spleen not palpable; blood pressure, 128/78. Urine: specific growth, 1010; acid; bile +; no albumin. Wassermann reaction negative. Van den Bergh reaction: 50 units; direct. Phosphatase: 9·4 units. Fæces: occult blood present.

Progress.—On July 9th there was severe epistaxis. The temperature remained normal until the 17th when there was a secondary rise which lasted until the 25th. Thereafter convalescence was uneventful. Urinary output 70–80 oz. daily.

Bacteriological findings.—No leptospiræ found in urine. Agglutination for *Leptospira icterohæmorrhagiæ* positive up to 1/300 two years after illness.

II

Colliery A. C. D., aged 34. Admitted Nov. 25th, 1933 discharged Jan. 16th, 1934. Three days before admission developed pain in the back and joints, shivering and vomiting. Fellow-worker of A. B. (Case I.).

Admission state.—Temp., 101·6°; pulse, 88; no jaundice on admission, but this appeared on the following day and rapidly deepened to an intense orange yellow; abdomen tender below right costal margin; liver palpable for 1½ in.; no splenomegaly. Urine: sp. g., 1018; acid; bile, +; albumin, +; granular casts. Van den Bergh reaction: 52 units; direct. Phosphatase: 5·5 units.

Progress.—The temperature swung for nine days and then remained normal until Dec. 8th when it was 99°. Next day there was a rigor with severe pain over the liver. The liver was palpable for 2 in. and tender and the temperature was 100·5°. The secondary fever lasted ten days and thereafter convalescence was uneventful. The urine output was from 40–70 oz. daily.

Bacteriological findings.—No leptospiræ in urine. Urine obtained on the nineteenth day of illness failed to produce the disease in two guinea-pigs. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/300 19 months after illness.

III

Colliery A. E. F., aged 26. Admitted Dec. 29th, 1933; discharged Jan. 20th, 1934. Illness began 14 days before admission with weakness, abdominal pain, and vomiting. He had been "working wet" in the pit. In three days jaundice was noticeable. A generalised erythema developed which lasted for 4 or 5 days. No bleeding.

On admission.—Temp., 97·5°; pulse, 110; general condition good; bright golden jaundice; nothing abnormal detected in heart, lungs, or abdomen; blotchy petechial rash over the trunk. Urine: sp. g., 1020; neutral; trace of albumin; bile, + +; no leptospiræ found. Fæces: clay-coloured; occult blood test negative. Van den Bergh reaction: total bilirubin, 22·5 units; direct reaction. Phosphatase: 8·7 units.

Course.—The patient was never seriously ill and there was no fever after admission. Recovery was uneventful.

Bacteriological findings.—Two guinea-pigs were inoculated intraperitoneally with 1 c.cm. of centrifuged urine obtained on Jan. 3rd (nineteenth day of illness). One died on Jan. 15th and the other was ill and was killed. Both showed jaundice, slight hæmorrhages and mottled lungs. Only a few dead leptospiræ were seen on dark-ground examination of material from the liver. A further sample of urine was obtained on Jan. 10th and a guinea-pig inoculated. It became ill and was killed on Jan. 24th. It showed jaundice, hæmorrhages in the intestine, and mottled lungs. Typical active *L. icterohæmorrhagiæ* were present in the liver on dark-ground illumination.

IV

Colliery A. G. H., aged 36. Admitted March 1st, 1934; discharged March 17th. Illness began six days before admission with pain in the neck, which he attributed to water dripping on him in the pit. Jaundice was noted on the following day. There was abdominal discomfort and he vomited several times. There was said to have been blood in the vomitus on one occasion. The bowels became constipated.

Admission state.—Not acutely ill; temp., 98°; pulse, 84; slight jaundice; no rash; nothing abnormal in lungs or heart; slight upper abdominal rigidity. Urine: sp. g., 1020; acid; no albumin; bile, +. Van den Bergh reaction: direct reaction positive; 16 units bilirubin. Cerebro-spinal fluid; bile-stained; total cell count, 136 per c.mm.; lymphocytes, 93 per cent.; polymorphs, 7 per cent.; protein, 0·12 per cent. Wassermann reaction positive.

Course.—There was slight pyrexia up to 101° for the first three days, after which the temperature fell to normal. Recovery was uneventful.

Bacteriological findings.—Blood, urine, and cerebro-spinal fluid all failed to produce illness in guinea-pigs. Agglutination of *L. icterohæmorrhagiæ*. Positive up to 1/300 16 months after illness.

V

Colliery A. J. K., aged 38. Admitted Oct. 27th, 1934; died Oct. 28th. Seven days before admission he complained of faintness and severe headache. Four days later he became jaundiced and vomited blood-stained material. Appetite lost and bowels constipated.

Admission state.—Temp., 97°; pulse, 104; very ill; intense jaundice and generalised petechial hæmorrhages; tongue dry and furred; abdomen tender and liver palpable for three inches. Urine: sp. g., 1015; acid; albumin and bile present. Fæces: occult blood present. Death occurred on the day after admission.

Post-mortem findings (Dr. J. G. Thomson).—Hæmorrhages and necrosis of upper third of rectus abdominis muscle. Lungs: very marked pulmonary œdema and small subpleural hæmorrhages; blood in trachea. Heart: petechiæ in pericardium and endocardium; stomach contained blood-stained fluid and showed four acute ulcers near the pylorus; small acute ulcer in the œsophagus 1½ in. from the cardia; numerous petechiæ and erosions in stomach. Liver: slightly enlarged; no striking lesions present. Kidneys: slightly enlarged; cortex swollen and pale and showed tiny petechial hæmorrhages; mucosa of pelves extremely hæmorrhagic. Intestines: a few petechial hæmorrhages.

Microscopical findings.—Kidney: much hyperæmia; intense cloudy swelling of tubules with debris in their lumen; glomeruli normal but proliferation of Bowman's capsule and debris in the capsular spaces. Liver: very marked cloudy swelling of the parenchyma cells generally with poor nuclear staining but no actual necrosis; the normal lobular structure had disappeared. No leptospiræ were found in Levaditi preparations of liver and kidney.

VI

Colliery C. L. M., aged 52. Admitted Oct. 30th, 1934; died Nov. 6th. Illness began ten days previously with headaches and malaise. Seven days later he became jaundiced. The headaches became less but the jaundice deepened and there appeared in all parts marks like bruises. The appetite became poor. Bowels were very constipated, but the fæces were never pale.

Admission state.—Temp., 97·8°; pulse, 88; general condition poor; drowsy and depressed. Intense orange jaundice; petechial hæmorrhages generalised; large contusion (said to be due to slight accidental blow) over left eye; hæmorrhagic labial herpes, and hæmorrhagic spots on tongue and uvula; tongue red and dry. Abdomen: liver edge extended to three inches below the costal margin; no tenderness or rigidity; spleen not palpable. Urine: sp. g., 1020; acid; albumin and bile present. Fæces: occult blood and bile present. Van den Bergh reaction: serum bilirubin 115 units; phosphatase: 8 units. Bile present in all specimens of urine until death.

Progress.—Patient became steadily worse. On Oct. 31st he passed 72 oz. of urine, and thereafter 10–20 oz. daily. He died on Nov. 6th.

Bacteriological data.—Blood was obtained immediately on admission and inoculated intraperitoneally into two guinea-pigs. Both remained healthy. They were killed and nothing abnormal was demonstrated. No leptospiræ were found in the urine.

Post-mortem findings (Dr. Thomson).—The pleural cavities contained a considerable amount of blood-stained fluid. Trachea and bronchi showed congestion. The right lung had in the upper lobe, posteriorly, two small wedge-shaped areas, each ½ in. in diameter, abutting on the pleura, which suggested recent infarcts. The heart showed extensive fresh hæmorrhages under the endocardium of the papillary muscles. The stomach contained much fluid blood and some small blood clots; petechial erosions numerous, especially near cardia; no gross ulceration. Duodenum normal; bile-ducts patent; pancreas normal. Gall-bladder distended with dark bile; mucosa dark red, suggesting some small hæmorrhages. Liver: slightly enlarged, with smooth capsule; dark olive green on section and friable. Kidneys: both considerably enlarged, weighing 19½ oz.; dark chocolate brown on section and cortex much broadened; glomeruli projected from the cut surface, and some diffuse hæmorrhages could be seen at the junction of cortex and medulla; small pale infarct 6 mm. in diameter in one kidney; pelves of both kidneys distended with blood clot.

Microscopical findings.—Kidney: glomerular tufts not ischæmic; proliferation of Bowman's capsule; tubules showed intense cloudy swelling and round-cell infiltration in places. Infarct in the cortex with an extensive hæmorrhage at its apex. A few hyalinised glomeruli. Liver: bile stasis; moderate cloudy swelling but no necrosis. No spirochætes were found in sections of liver and kidney stained by Levaditi's method.

VII

Colliery A. N. O., aged 51. Admitted Feb. 21st, 1935; discharged March 21st. Illness began seven days before admission with feeling of shakiness. Bleeding from nose four days before admission and on two occasions since. Shivered, sweated, and felt weak. Jaundice noticed three days before admission.

Admission state.—Temp., 99°; pulse, 92; bright yellow jaundice; hæmorrhagic labial herpes; tongue dry; no abnormality detected in heart, lungs, or abdomen. Blood pressure 140/70. Blood count: red cells, 3,900,000; hæmoglobin, 80 per cent.; white cells, 19,300 (polymorphs 78 per cent., eosinophils 1 per cent., lymphocytes 19 per cent., monocytes 2 per cent.) Urine: sp. g., 1015; acid; albumin +; bile, +. Fæces: occult blood, ++ on Feb. 25th: negative on March 6th. Van den Bergh reaction: bilirubin 40 units; direct reaction. Phosphatase: 8·2 units.

Progress.—The temperature was very erratic and never went higher than 100°. The urine showed steadily decreasing amounts of bile and albumin and was free from both by March 18th. The jaundice steadily diminished and was scarcely noticeable on discharge. There were no further hæmorrhages after admission.

Bacteriological data.—Blood obtained immediately after admission was inoculated intraperitoneally into two guinea-

pigs. Both remained healthy. One was killed on March 5th and no leptospiræ could be demonstrated in any of the organs. Urine obtained on Feb. 22nd (about eleventh day of illness) failed to produce the disease in both the guinea-pigs into which it was injected. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/1000 six months after illness.

VIII

Colliery B. P.Q., aged 36. Admitted April 2nd, 1935; discharged May 13th. Six days before admission he came home from work feeling well. He went to bed and woke up next morning feeling dizzy. He went back to bed and on that day was seized with severe pain especially in head, back, and legs. The pain lasted 2–3 days. On the day of admission he coughed up (?) some clots of blood. The bowels were loose. No jaundice noticed. He had been working as a coal-hewer in a wet part of the pit and his hair showed staining caused by the dye of his cap running, due to water trickling on to his head.

Admission state.—Temp., 101°; pulse, 112; very toxic, tongue brown-coated, clots of blood in nares; moderate jaundice; punctate petechial rash over left side of chest and abdomen; no abnormality in heart, lungs, or abdomen. Urine: sp. g., 1020; alkaline; albumin, +; bile, ++. Blood picture: red cells, 3,875,000; hæmoglobin, 84 per cent.; white cells, 10,600 (total neutrophils 95 per cent., lymphocytes 4 per cent., monocytes 1 per cent.). Fæces: occult blood, +. Wassermann reaction negative.

Progress.—At first he became worse. There was severe epistaxis on the day of admission and on the next day. On April 5th there was another severe epistaxis. The jaundice had become deeper. On the 12th he passed a melæna stool. From now onwards he slowly improved, the jaundice gradually faded, and bile and albumin were absent from the urine on discharge. The temperature fell to normal after the first day and never exceeded 99°. The pulse ranged from 70 to 100. When the jaundice had faded he appeared anæmic and a blood count on May 3rd showed red cells, 2,350,000; white cells, 7000; and hæmoglobin, 62 per cent.

Bacteriological findings.—Blood was taken on the day of admission (sixth day of illness) and two guinea-pigs were injected intraperitoneally, No. 1 receiving 2 c.cm. and No. 2 1 c.cm. of blood. No. 1 died 11 days, and No. 2 12 days later. Both animals were wasted and jaundiced. There were subcutaneous and peritoneal hæmorrhages and the lungs showed numerous hæmorrhages. Leptospiræ were present in the liver and kidneys of both animals. Urine was obtained on the thirteenth day of the illness and 2 c.cm. were injected intraperitoneally into a guinea-pig. It died 13 days later. The changes were similar to those in the animals injected with blood and leptospiræ were demonstrable.

IX

Colliery B. R. S., aged 29. Admitted May 2nd, 1935; discharged July 18th. Seven days before admission he complained of general malaise, severe headache, and sweating. Three days later he began to vomit and became jaundiced. The vomit was bright red. Epistaxis began on the third day. Bowels were not opened for five days. Pain in back of legs.

Admission state.—Temp., 99°; pulse, 100; ill and listless; moderate jaundice; blood pressure, 100/70; tongue coated; blood clots in nares; nothing abnormal in heart or lungs. Abdomen distended; tenderness in right hypochondrium; spleen not palpable. Urine: trace of albumin; bile, +; a few pus cells and red blood-cells; no casts. Blood-urea: 85 mg. per 100 c.cm. (June 24th). Fæces: occult blood ++ twice.

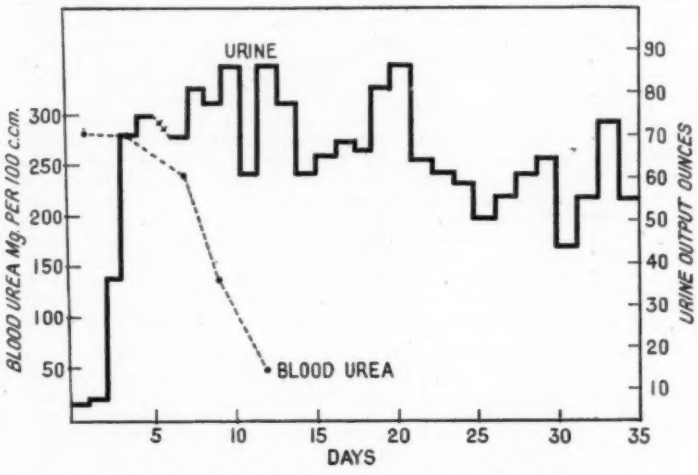

FIG. 1 (Case 10).—Chart of urinary output and blood-urea.

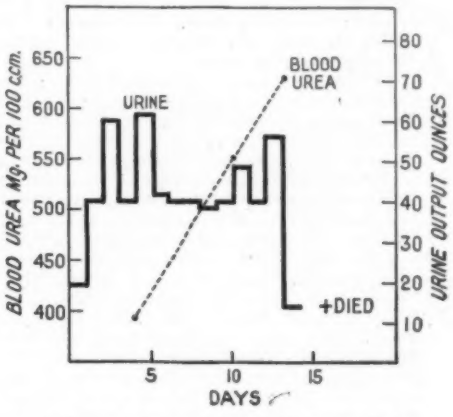

FIG. 2.—Urinary output and blood-urea in Case 11.

Progress.—For the first week he remained rather ill. The temperature reached 101°. There was further slight epistaxis. During the second to the seventh week improvement was slow with occasional evening pyrexia. The liver became palpable and felt hard. The jaundice became much fainter but never quite disappeared. On June 14th the temperature rose to 101°, but subsided on the next day. On the 18th it rose to 99·5° and the jaundice was more obvious. Antileptospiral serum (10 c.cm.) was given. On the 21st and 24th he had rigors. Circumcorneal injection was noted on the 22nd. Antileptospiral serum was again given on June 22nd, 29th, and on July 6th. The temperature reached normal on June 29th and remained there. Convalescence was uneventful.

Bacteriological findings.—Blood obtained on May 3rd (eighth day) failed to produce the disease in a guinea-pig. Urine obtained on May 9th (fourteenth day) was inoculated intraperitoneally into a guinea-pig. The animal died in two days; there was an icteric tinge of the intestines with slight injection; no mottling of lungs; dark-ground examination of liver for leptospiræ was negative. Another guinea-pig inoculated with an emulsion of liver died the next day. A second specimen of urine obtained during the relapse (June 20th) failed to produce disease in two guinea-pigs. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/1000 on July 18th (two and a half months after onset).

X

Colliery D. T. U., aged 32. Admitted May 27th, 1935; discharged June 29th. Illness began seven days before admission with diarrhœa and dull abdominal pain. The diarrhœa lasted for four days and was followed by complete constipation. Passed very little urine and his doctor found solid albuminuria. For 36 hours before

admission had passed no urine. Vomited several times and complained of headache and pain in back. The colliery in which he worked had recently been reopened and was very damp. His clothes were often soaked through. No serious illness previously.

Admission state (May 28th, eighth day).—Temp., 97·5°; pulse, 60; very ill and drowsy; tongue brown and dry, breath urinous; no obvious jaundice; Chvostek's sign positive; blood pressure, 90/70. Nothing abnormal found in heart, lungs, abdomen, or central nervous system. Fundi normal. Urine (3½ oz.) withdrawn by catheter was highly coloured but contained no bile; it was "solid" with albumin and contained numerous red and white blood-cells and granular casts. Blood-urea: 285 mg. per 100 c.cm.

Progress and further investigations.—Next day he was less drowsy. Slight jaundice now present; marked conjunctival injection. Urine passed (4 oz.) still solid with albumin, but now giving a faintly positive Gmelin's test for bile-pigments. Blood pressure 110/80.

On the 30th (tenth day) jaundice was well marked, a general golden yellow; copious epistaxis; 34 oz. of urine passed; albumin, ++. Blood-urea: 280 mg. per 100 c.cm. Van den Bergh: direct positive 18 units. Phosphatase 10·6 units.

On the 31st jaundice was more intense; heavy epistaxis; liver palpable two fingers-breadths; occult blood positive 20 seconds. Blood count: red cells, 3,420,000; hæmoglobin, 67 per cent.; white cells, 13,250 (polymorphs 76 per cent., metamyelocytes 3 per cent., myeloblasts 1 per cent., lymphocytes 14 per cent., monocytes 4 per cent., eosinophils 2 per cent.). Antileptospiral serum (10 c.cm.) given intravenously. Patient passed 74 oz. of urine containing only a trace of albumin and moderately bile-stained. From now onwards there was steady improvement. Antileptospiral serum (10 c.cm.) was repeated on June 1st and 4th. The jaundice steadily faded and had disappeared within three weeks from the onset. The urine output never fell below 40 oz. daily and albumin had disappeared on the seventeenth day of illness. The blood-urea fell slowly, being 240 mg. on June 3rd, 135 mg. on the 5th, and 49 mg. on the 8th. At no time did the temperature rise above 99° or the pulse above 90. During convalescence anæmia was noticeable and on June 11th (21 days from onset) the blood picture was: red cells 3,020,000; hæmoglobin, 55 per cent.; white cells, 14,400 (polymorphs 85 per cent.—no immature forms—lymphocytes 12 per cent., monocytes 1 per cent., eosinophils 2 per cent.).

Bacteriological findings.—Guinea-pigs inoculated intraperitoneally with blood obtained on the eighth day of illness and urine obtained during the first and second week remained in perfect health. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/3000 one month from onset.

XI

Colliery A. V. W., aged 56. Admitted June 8th, 1935; died June 24th. Eight days previously illness began with generalised vague pains. On the seventh day abdominal pain commenced, and during the next 24 hours was intense and accompanied by vomiting and hiccup with a tinge of jaundice. The urine had been scanty and bile-stained. Some of the vomit contained blood-stained material.

Admission state.—Temp., 97·8°; pulse, 96; bright orange jaundice; small petechial hæmorrhages over thorax and root of neck; slight itching of the skin; tenderness below the right costal margin, but neither gall-bladder, liver, or spleen palpably enlarged; no rigidity. Blood pressure, 100/56. Urine: sp. g., 1012; acid; bile present; trace of albumin. Fæces: occult blood present. Van den Bergh: direct reaction intense positive; total bilirubin 40 units.

Progress.—On June 10th patient had severe epistaxis and complained of pains in back and legs. Temperature had never been above normal since admission. Testes were painful and extremely tender, but not swollen. Antileptospiral serum (10 c.cm.) given. Next day he was passing very little urine; bowels constipated. Blood-urea: 387 mg. per 100 c.cm. (Fig. 2). Cerebro-spinal fluid: bile-stained fluid under no increase of pressure; colour due to bilirubin, giving direct van den Bergh reaction; protein 0·08 per cent., sugar slightly diminished, chlorides 0·72 per cent., total cell count 64 per c.mm. (all lymphocytes). A further 10 c.cm. serum given and again on the 12th.

On the 14th the jaundice was more intense. More urine was being passed (40–60 oz.), but still intensely bile-stained. Albumin a trace. Complained of pains generally in body and limbs, but especially in the back. Another severe epistaxis. Generalised conjunctival suffusion. Serum (10 c.cm.) was again given. A blood count showed:—

Red cells ..	3,020,000	Polymorphs ..	85%
White cells ..	10,625	Lymphocytes ..	11%
Hb.	63%	Monocytes ..	3%
Colour-index ..	1	Eosinophils ..	1%
Reticulocytes ..	1·6%		
Platelets ..	100,000		

The patient continued to receive 10 c.cm. of antileptospiral serum daily. He was intensely jaundiced and drowsy, passing about 40 oz. of urine per day. Temp., 97°; pulse, 80 (June 17th). Blood pressure, 90/50; blood-urea, 550 mg. per 100 c.cm. On the 18th the urine (40 oz. in all) contained only a little bile; sp. g., 1012; trace of albumin; urea-concentration, 1·62 per cent.; a few leucocytes, no casts seen. Intravenous glucose 200 c.cm. given. On the 19th the liver edge was palpable about an inch below costal margin; spleen not palpable. Blood-urea: 630 mg. per 100 c.cm. On the 21st the blood pressure was 100/60. Urea-concentration 1·64 per cent. Jaundice rather less: no purpura remained. Blood transfusion of 8 oz. given and made up to 10 oz. with 25 per cent. intravenous glucose solution. Antiserum and intravenous glucose continued daily. On June 22nd at 12.30 A.M. the patient was very restless and crying out at intervals. During that day the urea-concentration was 1·58 per cent. in urine. A few red cells and leucocytes were to be seen with granular and epithelial casts. He died on the 24th.

Bacteriological data.—Leptospiræ were found in urine on June 14th. Urine obtained on the 12th (twelfth day) was inoculated intraperitoneally into a guinea-pig and the animal was killed on July 1st. The post-mortem was negative. Blood was inoculated intraperitoneally into a guinea-pig on the 12th and on July 1st it was found that the liver was jaundiced, a few leptospiræ being detected in smears. A portion of liver was inoculated into another guinea-pig on the same day and this animal was killed on July 31st. The findings were: great wasting; a few striated hæmorrhages in lungs; a few infarcts in the kidneys; a few leptospiræ in smears from liver and kidney.

Post-mortem findings (Dr. G. E. Stephenson).—Heart: normal. Lungs: emphysema and chronic bronchitis; some broncho-pneumonia in right upper lobe and recent hæmorrhagic infarct in lower lobe. Spleen: small; no gross abnormality. Liver: average size; dark olive green on section with lobular outline distinct. Gall-bladder contained 1½ oz. light golden yellow bile and debris; no calculi. Kidneys: swollen and soft; capsule thin and stripped easily; surface smooth; cortex swollen and bile-stained; submucosal hæmorrhages in the pelvis. Stomach: numerous submucosal petechial hæmorrhages at fundus and pyloric end. Duodenum and intestines showed no pathological changes. Brain: swollen and œdematous; small subarachnoid hæmorrhage at vertex of right cerebral hemisphere.

Microscopical findings.—Liver: biliary stasis marked; cloudy swelling moderate; no necrosis and no inflammatory cells seen; normal lobular structure well preserved; no leptospiræ found in sections stained by Levaditi's method. Kidneys: much hyperæmia; glomeruli generally healthy though a few showed early sclerotic changes; patches of round-cell infiltration in cortex, and tubules showed well-marked cloudy swelling; no leptospiræ found.

XII

Colliery E. X. Y., aged 46. Admitted June 24th, 1935; died June 25th. Illness began seven days before admission with headache, malaise, and nasal catarrh. Profuse sweating but no pyrexia. Four days later jaundice

appeared and quickly deepened. Became delirous and vomited. A hewer in the pit and had "worked wet." There was said to have been another case of jaundice from the same pit.

Admission state.—Temp., 98°; pulse, 96; blood pressure, 90/65; deeply jaundiced; petechiæ scattered over body, most obvious on forearms; circumcorneal injection; Chvostek's sign positive. Heart normal. Lungs: basal râles. Abdomen retracted; liver not palpable. Urine: 10 oz. drawn off by catheter; acid; sp. g., 1019; urea, 1·9 per cent.; trace of albumin; bile, ++; red cells, ++; occasional casts and pus cells. Blood-urea: 567 mg. per 100 c.cm. whole blood. Blood protein: 7·23 mg. per 100 c.cm. serum. Blood calcium: 9·1 mg. per 100 c.cm. serum. Van den Bergh reaction: direct positive; 46 units.

Progress.—Antileptospiral serum (10 c.cm.) given on June 25th. Patient died the same evening.

Bacteriological findings.—Blood was inoculated intraperitoneally into a guinea-pig on June 25th (eighth day). The animal was killed on July 18th; post-mortem negative.

Post-mortem findings (Dr. Stephenson).—Heart: a few subpericardial hæmorrhages; muscle soft and friable; subendocardial hæmorrhages at bases of papillary muscles. Lungs: congestion and œdema; no pneumonia. Spleen: not enlarged; congested. Liver: not enlarged; lobular outline distinct. Gall-bladder: healthy. Left kidney: atrophied, weight 1½ oz.; capsule thickened and adherent; surface red and granular; cortex greatly atrophied. Right kidney: much enlarged; capsule thin, not adherent; surface smooth; cortex broadened with a few punctate hæmorrhages; hæmorrhages in mucosa of pelvis. Bladder empty.

Microscopical findings.—Right kidney: increased vascularity; glomeruli normal; cloudy swelling in tubules. No leptospiræ found in Levaditi preparations.

Summary

(1) A hitherto unsuspected source of leptospiral infection is present in certain coal-mines in Northumberland and Durham. (2) Twelve cases of Weil's disease among miners are described with a mortality of 33 per cent. (3) There was a history of working in damp rat-infested seams in all except one case. (4) The diagnosis was confirmed by bacteriological examinations in nine cases. (5) Interesting features were very high blood-urea figures in three cases and a lymphocytosis in the cerebro-spinal fluid in two cases.

We wish to thank the honorary medical staff of the Royal Victoria Infirmary and the medical superintendent of the Newcastle General Hospital for permission to publish cases under their care; Dr. H. J. Slade of the bacteriological department of the Royal Victoria Infirmary and the staff of the Durham University College of Medicine bacteriological laboratory for carrying out guinea-pig inoculations; and Major H. C. Brown of the Wellcome Bureau who very kindly performed the agglutination reactions.

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INTERNATIONAL PHYSIOLOGICAL CONGRESS

(Concluded from p. 448)

AFTER the official closing of the Congress in Moscow on the afternoon of August 17th the members did not immediately scatter. In the evening they were entertained to a banquet in the Kremlin by the members of the Soviet Government, headed by the President of the Council of People's Commissars, supported by many officers of the Red Army. An opportunity for sightseeing in the Kremlin was unfortunately not offered, and the glimpse afforded at the reception was somewhat tantalising. The hall of St. George in the Great Palace, where the banquet was held, was all of white marble with pillars set into the wall, and must have impressed most of the guests as the most splendid banqueting hall they had ever seen. Outside the great windows the moon showed up the green and golden clustered domes of the cathedrals of the Archangels, of the Assumption, and of the Annunciation.

On the next day many of the Congress members went to a great air display, while others preferred to spend their time in visiting scientific institutions, including especially the Institute of Animal Breeding and the Central Institute of Nutrition. In the former, demonstrations were given of the methods of artificial fertilisation of larger and smaller farm animals, which the Soviet workers have learned and adopted with success. Where the supply of pedigree sires is small and the geographical area to be covered enormous, such a procedure, with distribution by aeroplane, has obviously great advantages—provided that it can be made reasonably successful. Practical use was also being made of production of artificial heat at convenient times, by injection of œstrin, and of diagnosis of pregnancy, especially in mares, with the Aschheim-Zondek reaction.

The Central Institute of Nutrition in Moscow consists of laboratories and a clinic of 125 beds in a separate building. The laboratories are concerned with scientific studies which are mainly in connexion with practical problems of nutrition. Since in Moscow alone 2½ out of the 4½ million people are fed in public dining-rooms, with three hot meals a day, it is obvious that there is plenty to do, if nutrition is to be placed on a sound basis, qualitatively and quantitatively. Particular attention was being paid to the changes which foods undergo in the process of manufacture, to the designing of containers for the distribution of food, and to the devising of flavouring materials which could be prepared on the large scale and which would keep.

Dietary surveys throughout the U.S.S.R. are also undertaken, and Prof. Moltschanowa had recently returned from Tashkend in Central Asia with an incredible amount of luggage, the fruits of a dietary survey, accompanied by a study of the mineral balance and the basal metabolic rate of the people consuming the diets. All the materials collected had to be worked up in Moscow. In the vitamin department Dr. Jarussowa, under Prof. Lavrov, had been engaged on the practical problem of devising a cheap antiscorbutic which could be consumed by people engaged on construction work in labour camps in Siberia, where the ordinary forms of fresh food are difficult to obtain. A potent concentrate has been prepared from spruce needles, which is said to have met the requirement adequately.

In the clinic connected with the Institute of Nutrition patients were selected for purposes of investigation who were suitable for a treatment exclusively dietetic—particularly persons suffering from liver and kidney diseases, from acute rheumatism, from gastro-intestinal diseases, and from some forms of heart disease. Conditions such as gastric ulcer are treated as constitutional rather than local diseases, and the idea seems to be prevalent in the U.S.S.R. that drugs should be avoided wherever possible. The patients seemed to be very well cared for, but it was of course impossible in a single visit to judge of the success of the methods used. This last truth, indeed, applies to the formation of any opinion with regard to the state of social welfare in the whole Soviet Union. Only those who have made more than one visit are competent to report whether progress is being made or not, and it is on the making or not making of progress that a favourable or an unfavourable verdict must be based.

In judging the hospitality of the Government of the U.S.S.R. towards foreign scientists, however, every member of the Congress is an expert, and there is no doubt that the verdict would be completely unanimous. A more delightful welcome has never been offered.

MEDICINE AND THE LAW

Motorist's Consent to Medical Examination

SOME months ago a High Court judge invented a telling method of challenging the medical evidence adduced against motorists who are charged with driving a car while under the influence of drink. He impaled the witness upon the horns of a dilemma. The police surgeon had no right to examine the motorist without the latter's consent: a drunken man cannot give consent. Either, therefore, the motorist was sober because he gave a valid consent to be examined, or else, if he was drunk, his condition could not be described and the prosecution must fail for want of evidence. Alert advocates have naturally made use of this weapon in defence of motorists, for what it may be worth. Thus at the South Western Police-court last month the point was taken by Mr. Laurence Vine on behalf of Mr. R. M. Hutchinson, better known as Harry Tate, the comedian. Dr. R. Anderson, the divisional surgeon, was describing his examination of the accused when Mr. Vine objected that there was no legal right to examine a man who is under the influence of drink. The witness said he had asked the defendant's permission to examine him. "You must have thought," suggested Mr. Vine, "that he was in reasonable possession of his faculties or you would not have asked such an important question about his consent to the examination." The witness replied that he asked the question before he had come to any decision as to Hutchinson's condition. The case, which was remanded, presented no other feature of interest except that the magistrate queried whether it was quite a fair test to ask a man of 63 to stand on one leg—"some elderly people may not be able to stand on one leg, drunk or sober."

When Mr. Justice Rigby Swift first introduced to the public this forensic dilemma about medical examination, the Home Office and the Directorate of Public Prosecutions are believed to have been taken somewhat by surprise. Later the point was viewed with more equanimity. It was a better point under the earlier law when a motorist could be punished for being drunk while in charge of a car than under the present law (Section 15 of the Road Traffic Act, 1930) whereby it is an offence to be merely "under the influence of drink." Magistrates may often find themselves able to decide that a man was not too drunk to have consented to be examined and yet drunk enough to have imperfect control of a car. At common law a drunken person is not incapable of contracting. His contracts are voidable only if he was, at the time and to the other party's knowledge, unable to understand the effect of the transaction. In criminal cases the drunkard is said to obtain no privilege from his condition; he has voluntarily abandoned control of himself and, in Sir E. Coke's words, "what hurt or ill soever he doeth, his drunkennesse doth aggravate it." The law to-day is unlikely to tolerate an argument which would prevent a medical witness from describing the defendant's condition when that condition is the main element in the alleged offence. The accused would gain little if the police surgeon states "his condition was such that in my opinion he was unable to give consent to medical examination."

The Taking of Fingerprints

If medical examination without the examinee's consent can be regarded as a technical assault, it is akin to the taking of a person's fingerprints without authority. Last week some juvenile offenders were being dealt with by magistrates when a parent protested that his son's fingerprints had been taken, and asked (though without success) that they should be destroyed. It is nowadays forbidden to use the words "conviction" or "sentence" in connexion with a child or young person who is dealt with summarily (Section 59 of the Children and Young Persons Act, 1933), and, if we are no longer to brand juvenile offenders as criminals, the protest was natural. The police, however, may well wish to have some record (if proper power exists to take it) whereby they can check the activities of young persons who get into trouble. It is necessary to use every aid to detect the identity of an offender even if, when brought before the magistrates, the offender suffers no severe penalty. No authority has any power to take persons' fingerprints, unless they consent, without first having such persons committed to prison. It is not quite clear why the boys, in the recent case just mentioned, had been so treated. In prison the procedure is presumably governed by the Prison Rules of 1933. These prescribe that the name, age, height, weight, particular marks, and such other measurements and particulars as may be required are to be recorded when the prisoner is admitted to prison and from time to time afterwards in such manner as may be directed. He may also, "if required for purposes of justice," be photographed on reception and subsequently; but no copy is to be given to any unofficial person. In some countries the taking of fingerprints is allowed full scope for civil purposes; in England there is a fierce prejudice against the process for any but criminals. We do not object to having our births, baptisms, addresses, and marriages recorded but we find it degrading to have our fingerprints registered. Persons found wandering and suffering from supposed loss of memory cause endless trouble before they are satisfactorily identified; bodies cast up by the sea or found dead elsewhere remain mysteries; innocent persons are arrested and inconvenienced for want of easy proof of their bona fides. In all such cases anxiety and expense are caused because there is no universal system of registering finger-

prints. Classification of skin impressions could index the whole human race. In England public opinion tolerates the system for the purpose of criminal records only.

Tetanus after Appendix Operation

An inquest was concluded at Rochester on August 29th upon the death of Miss Alma Leworthy from tetanus. The deceased, aged 32, had undergone an operation for appendicitis in St. Bartholomew's Hospital, Rochester. Dr. Schulenberg, resident surgical officer, described the results of his post-mortem examination. The operation wound, he said, was soundly healed. It was examined for pieces of catgut; only a piece of thread was found; this was kept for culture. Asked by the coroner as to the source of the tetanus germs, the witness stated that the germ must have entered the patient's body while she was in hospital, and the abdominal wound would be the site of infection. He could not say if it was due to the catgut. Instruments and catgut were sterilised; but this was an abdominal operation and tetanus might arise from the intestines. The tetanus germ was found in the intestines of a small proportion of people; it might lie dormant till it entered the system through a wound. The coroner read a report from the pathological department of the Ministry of Health. It stated that there was no evidence of *Bacillus tetani* in the samples of catgut sent by Dr. Schulenberg, but that cultures taken of tissue gave convincing evidence of the existence of such bacilli. The witness observed that the report merely proved that death was due to tetanus; it did not explain the source of infection. A theatre sister described to the coroner the process of sterilisation of catgut at the hospital, as it had been in operation for the last eight years. In summing up, the coroner referred to the possibility of the tetanus germs entering an abdominal operation wound from the intestines, no matter how careful the surgeon might be. He considered that the high reputation of the hospital had not been tarnished. The jury returned a verdict of death from misadventure and exonerated from blame all concerned in the case.

PANEL AND CONTRACT PRACTICE

Extension of Medical Benefit

IT is generally agreed that medical benefit under the National Health Insurance Acts, although good so far as it goes, does not go far enough. From that point however two lines of thought diverge. The adherents to the one line of thought say, "let us extend medical benefit to the dependants of insured persons and thus make national health insurance an integral part of the general health services of the country." Those who take the other point of view say, "let us improve medical benefit itself and endeavour to provide specialist services, laboratory services and the like, to those persons who are insured and who are, therefore, paying for it." The National Association of Insurance Committees adheres to the latter view, and in conjunction with the National Conference of Friendly Societies has decided to call a conference for the purpose of discussing an extension of the services at present available to the existing body of insured persons. The medical profession will be represented at the conference, at which will be discussed the provision of expert medical advice and treatment and laboratory services to supplement and render more effective the general practitioner service for insured persons, in the form of an independent scheme organised under the general direction of the Minister of Health as an integral part of medical benefit.

A Revised Clause

The new Medical Benefit Consolidated Regulations are already in proof, and it is expected that they will be issued very shortly. One amendment in the terms of service, which form the first schedule to the regulations, will be of special interest to insurance practitioners. Under the revised Clause 7 (3) an insured person who, having failed to make the practitioner aware of his claim to be entitled to medical benefit, has incurred expenses either by way of payment or by receiving an account, may apply to the insurance committee for an adjustment of the matter. The committee, if satisfied of the applicant's title to benefit and of the bona fides of his application, may, if they think fit, either refund the amount charged and debit the doctor's account or require the withdrawal of the account rendered; in either event they must credit the practitioner with the remuneration to which he would have been entitled if the applicant had been attended by him as a temporary resident. Applications for consideration under this clause must be made by the insured persons within one month at present, and it is by no means in every case that insurance committees accede to the applications. Superior persons who cannot be bothered with the panel, and so on, until they have incurred expense or received an account meet, as a rule, with short shrift at the hands of committees. But there are more worthy cases—e.g., the man who has been out of work for a long time and whose title to sickness benefit has perhaps expired, and who may think (who can blame him?) that his title to medical benefit has also expired; or the woman who has been married and has been transferred to Class "K." It is proposed in future to extend the period of one month to three months, and to make the clause applicable to cases where a bona-fide mistake has been made by a doctor either in charging a fee or in rendering an account, irrespective of whether the patient is, or is not, on his list. Hitherto Clause 7 (3) has not applied in cases where the patient was on the doctor's list and, strictly speaking, in any case where a doctor had charged for treatment rendered to a patient whose name was in fact included in his list the case fell to be dealt with by the medical service subcommittee. Obviously there is here a divided responsibility. It is the applicant's duty to make it clear to the doctor that he is an insured person, but on the other hand the doctor has been supplied by the insurance committee with a list of his patients in the shape of forms of medical record. Cases have frequently arisen in which, there being no suggestion of bad faith on the part of a doctor, insurance committees have turned a blind eye to the potential breach of the terms of service and have adjusted the matter, with the consent of both parties, by debiting the doctor and refunding the amount paid to the insured person. Adherence to the letter of the regulations would have led to quite unnecessary hearings by service subcommittees. The revised clause will give them proper authority for dealing with genuine mistakes in another way, and it will be welcomed alike by doctors and by committees.

An Unsubstantiated Complaint

Practitioners may sometimes have to defend themselves against accusations which have little if any substance in fact, but this aspect of the case may not become apparent until after a protracted hearing, as in the following case recently investigated by the London medical service subcommittee.

An insured woman, 67 years of age, was given by her daughter a dose of furniture polish one evening in mistake for medicine. The doctor, who was already attending her for subacute pleurisy, paid a visit the following morning when the woman complained of severe headache. It was only after leaving the house that he met the daughter in the street and was told of the mishap. Thereupon he returned to the house and issued an order for the patient's admission to hospital, warning the relatives of the possibility of a sudden collapse due to poisoning. He gave instruction that the remainder of the polish should be taken to hospital with the patient in order that its nature might be ascertained. Later in the day the son called and told him that his mother would not go into hospital and that her relatives did not want her to go, adding that he understood the furniture polish was harmless. The doctor, mindful of the possibility of delayed collapse sometimes associated with camphor poisoning, insisted on the patient's removal to hospital, stating that if his instructions were not followed he would not provide further treatment. He did however instruct the son to report during the evening on the patient's condition. No report was made, but three days later the son called and asked the doctor why he had not visited the patient. The doctor reminded him of their conversation, and the following day he sent a note to facilitate the insured person's transference to another doctor, adding the name and address of a doctor with whom he had arranged for treatment to be provided, if desired, by the relatives.

The relatives complained that the doctor had improperly refused to provide treatment for the insured person and that in consequence it was necessary to obtain the services of another doctor. In the view of the medical service subcommittee (which was adopted by the insurance committee) there was no refusal to attend. The doctor saw the patient twice on the morning of Jan. 18th, and did the proper thing in the circumstances when he advised immediate removal to hospital and gave the necessary document to facilitate admission. By refusing to go the patient (and her relatives) took a very grave risk. The other doctor who was called in on Jan. 19th evidently found nothing urgent in the patient's condition as he did not call again on the next day. What the relatives could and should have done was to have gone back to the doctor and told him that the patient had not entered a hospital, and, if her condition necessitated it, asked him again to attend. As they did not do this the committee took the view that the expenditure incurred in obtaining other treatment was neither reasonably nor necessarily incurred and the doctor could not be held liable for it. Subsequently the doctor arranged for a deputy to attend on his behalf, if so desired, pending arrangements for the transfer of the insured person and he gave the necessary facilities for such transfer. The committee saw no reason to criticise his action.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE STUDENTS' OLYMPIAD

THE meeting to decide the high-school athletic championship of the world ended here on August 18th. Twenty-eight nations were represented, and in the final results Hungary was first (481 points), Germany second (465), England third (146), Czechoslovakia fourth (102), France fifth (101), and Japan sixth (88). The city of Budapest entertained the competitors at receptions, banquets, and excursions, and the arrangements made for their accommodation were admirable. As it was holiday time it was possible to find quarters for many of them at schools and colleges. Their food was strictly supervised, and as a result no digestive or gastric illness occurred, though the guests took full advantage of the abundance of varied and cheap fruits which were available. One case of enteric fever was reported but as the patient had a high temperature two days after he left Stockholm he must have been infected in Sweden. There was no dysentery and, apart from one fractured wrist, no serious accident.

TWO BUDAPEST DOCTORS FIGHT A DUEL

Two young doctors, both junior dressers in the surgical section of the New St. John's Hospital, disagreed on some professional matter just before preparing for an operation. The disagreement became heated, and finally the disputants so insulted one another that a challenge to a duel was issued and they fought with swords in a well-known Budapest fencing hall. The fight lasted about ten minutes and one of them received a deep cut on his forehead, penetrating to the periosteum, which required 17 stitches.

RESTRICTION OF SALE OF CAUSTIC POTASH

Caustic potash is used by every housewife in Hungary on washing-day and is sold by every grocer in the form of long sticks. This closely resembles the cheapest kind of sweet popular among poor children, and many accidents have thus been caused. During one fortnight no fewer than 18 children between the ages of two and five suffering from caustic poisoning were brought to the New St. John's Hospital. Many cases of suicide and attempted suicide also are due to caustic potash, for every servant girl deceived in love can get hold of it, and they are apt to disregard the fact that the death it brings is a terrible one. The number of such cases has long caused concern. A few years ago the Minister for the Interior issued an order regulating the sale of caustic potash, but this did not seem to remedy the evil. A new Act now come into force is much more strict. It decrees that caustic potash is to be regarded as a poison, and is to be indicated in the pharmacopœia with a cross. When caustic is sold it must have a label marked with a skull and another label on which it is stated that caustic potash is a deadly poison and is to be kept under lock and key, while especial care must be taken that it does not get into the hands of children. Anyone who sells caustic must call the attention of the customer to its dangers every time a purchase is made, even though the customer has already bought the article many times from him. Hitherto shopkeepers selling caustic without a licence or failing to call the customer's attention to its dangers have been guilty only of a misdemeanour. But now, if negligence in this respect leads to accident or suicide, he will be punished for a felony.

DRINK MORE WINE

The production of wine is one of Hungary's most important industries, but restrictions imposed by

other countries have reduced exports to such an extent that it is threatened with disaster. The home consumption of wine, despite its low price, has also fallen. In order to give the industry a fillip it has been arranged that the authorities shall supply a daily ration of half a litre of wine to every soldier in the army. The soldiers are glad to promote the interests of the winegrowers in this way.

TAXATION OF THE CHILDLESS

In view of the falling birth-rate of the last ten years the ministerial council has accepted the draft of a Bill for the taxation of bachelors, married couples without children, and married couples with only one child. According to this scheme the income-tax for bachelors will be raised by 25 per cent., for childless couples by 15 per cent., and couples with one child by 10 per cent. Whether this will lead to an increase in the birth-rate is as yet problematical. But since the decrease in the birth-rate is due to the present economic depression it is probable that only a general improvement in the financial conditions and better prospects will make a change.

PARIS

(FROM OUR OWN CORRESPONDENT)

SIGNS OF THE TIMES

ECONOMY is the order of the day here, with increased taxation, decreased style of living, and a general post in the course of which we all do our best to encourage our neighbours to be honest. An example of such vicarious activity in the matter of income-tax has recently come to light. A surgeon attached to a hospital admitting paying patients discovered one day that the inspector of taxes had been scrutinising the entries made in the books of the hospital in order to ascertain from a new angle what were the fees the surgeon was charging his patients. As the books in question contained references to diagnoses, the enterprising inspector exposed himself to a conviction for the violation of professional secrecy—a subject on which French legislation is very emphatic. The incident is, therefore, not likely to recur; but is symptomatic of the present situation. It is proposed to save a quarter of a million francs a year in the budget of Paris—at the expense of the medical profession. This economy is to be effected by the discontinuation of medical certificates testifying to the birth of a child. The *Syndicat des Médecins de la Seine* has decided to reduce the fees charged by its members by 10 per cent. as a spontaneous gesture of solidarity and patriotism. With his rent reduced by 10 per cent. and with corresponding reductions in the cost of his gas, electricity, and coal, the doctor who forgoes a tithe of his professional income in a "gesture of spontaneous patriotism," gains as well as loses in this period of economic upheaval.

ANTIRABIC TREATMENT AT HOME

Dr. P. Remlinger and Dr. J. Bailly,[1] of the Pasteur Institute in Tangiers, whose bacteriological studies have brought them deserved prestige, have attacked the tradition of some 50 years' standing that everyone bitten by a rabid animal should be sent to a Pasteur Institute, however far away it may be, there to be treated for some 15 to 25 days, according to a mystic ritual. During the past ten years there have been signs of revolt against this centralisation of orthodoxy to which Italy, Russia, Portugal, India, and Japan have all conformed. Since 1925 Prof. Puntoni, of the Anti-rabic Institute in Rome, has been distributing a carbolised vaccine to a great number of anti-rabic dispensaries. His views as to the harmlessness and potency of the virus of rabies treated by carbolic acid have been confirmed in many quarters, and the statistics of decentralised vaccination with a dead vaccine are said to show that it is in no respect inferior to treatment with vaccines prepared by attenuation of the virus at a central Pasteur Institute.

THE HISTIDINE TREATMENT OF GASTRO-DUODENAL ULCERATION

Prof. Emile Aron, of the medical faculty of Tours, has for some time been studying the effect of daily injections of histidine on the experimental gastro-duodenal ulceration in dogs. Since Jan. 1st, 1933, he has also treated some three score human patients in like manner and with results as encouraging as those recently published by Dr. E. Bulmer.[2] With regard to the rationale, Prof. Aron finds that histidine does not act merely by relieving pain, but also by changing the "anatomical evolution of the lesion." This explanation sounds a trifle vague, and there is more precision in the description given of the technique of the injections and of the results achieved. The latter are the more impressive because most of the patients were treated under ambulatory conditions, with few dietetic restrictions, and with only small doses of atropine to supplement the subcutaneous or intramuscular injections of histidine.

CENTENARY OF DR. MAGNAN

Dr. Valentin Magnan, who died on Sept. 27th, 1916, was born in 1835. To the present generation of psychiatrists in other countries than France he is now little more than a name. Yet, with only two or three exceptions, he did more for practical and clinical psychiatry than any other Frenchman. As a clinician, he was tireless in the detection and correlation of signs and symptoms of mental disease, and by defining certain morbid types he did much to promote both diagnosis and prognosis. The mental hospitals with which his name is associated are the Antiquaille of Lyon, the Bicêtre, the Salpêtrière, and the Sainte-Anne. He was curiously like Pinel in many respects—the same clinical acumen, the same kindly devotion to the happiness of each patient. Though Pinel had already done much to make the treatment of the insane more humane and had achieved immortality as "the man who broke the lunatics' chains," Magnan in his early days found much need for reform. Chains were dispensed with, but not isolation cells nor strait-jackets. Some 8 per cent. of the subjects of delirium tremens are supposed to have died from the effects of mechanical restraint. Magnan's substitute for this strait-jacket was the bed. He put his patients to bed as soon as possible and kept them there until his clinical examinations were completed and the patient had had all the rest the bed could give him. Magnan was, in fact, the apostle of passive restraint and rest in bed. Above all, he created and maintained the tradition that because an asylum happens to be a public institution, it must never be allowed to degenerate into an impersonal machine whose victims feel that human kindness has gone out of their lives.

[1] Presse méd., July 27th, 1935, p. 1195.
[2] THE LANCET, 1934, ii., 1276.

CORRESPONDENCE

ADHESIVE STRAPPING AND THE PATCH-TEST

To the Editor of THE LANCET

SIR,—Since I adopted the methods of Mr. Frank Romer in 1923 I have used adhesive strapping for the support and immediate function of many thousands of injured joints and muscles, encountered among successive undergraduates in Cambridge. Naturally time and experience have led to modifications in actual technique—e.g., I now use an under-layer of Elastoplast, followed by "interlocking" strapping. The fact remains, however, that I can claim to have applied a vast amount of strapping to the human skin. The annotation in your issue of Aug. 17th (p. 382) rightly divides strapping dermatitis into (1) mechanical, and (2) allergic. It is mainly concerned with the latter variety, the ways of employing the "patch-test," and the possibility of "reaction delayed not only 24–48 hours . . . but for as long as 14 or even 24 days." It therefore appeals for "standard conditions" among different research workers.

Now such lengthy preliminaries may be possible before deciding upon the use of strapping in chronic "gravitational affections of the legs," but where a recent injury demands prompt decision and treatment it is impracticable to embark on prolonged tests. In face of this, it is happily my experience that sensitisation dermatitis is extremely rare in practice, and that its incidence is even less since the introduction of elastoplast. I would go so far as to say that it is almost negligible. With regard to the "mechanical" variety, and taking the ordinary sprained ankle for illustration, it is true that walking "from the word go" may incur trauma by pressure of the creasing on the skin over the antero-inferior aspect of the joint. This however is prevented by daily reapplication for the first few days, as the swelling recedes, and the formation of shifting creases thereby. Opportunity is thus incidentally afforded for inspection of the whole area, and for the early discovery of any allergic tendency.

It would therefore appear that neither the bogy of allergy, nor the academic interest of varied "patch-tests," is commensurate in importance with the enormous saving in sick-wastage after sports injuries, to be gained from the immediate employment of strapping, properly applied. As I have recently written (Camb. Univ. Med. Soc. Mag., June, 1935), "Unnecessary sick-wastage and lasting disabilities, to say nothing of blighted ambitions, result from delayed and obsolete treatment. It is insufficiently realised that, on a less dramatic scale, a severe muscular or ligamentous injury may be as much a surgical emergency as the 'acute abdomen.'"

I am, Sir, yours faithfully,

Cambridge, August 26th. R. SALISBURY WOODS.

To the Editor of THE LANCET

SIR,—Your annotation raises the question of dermatitis due to adhesive plaster. Some years ago I carried out a small research on the same lines as Schwartz and Peck and came to the same conclusion —viz., that the resinous constituent of the plaster caused the trouble. This constituent is the main variable in the different makes of adhesive plaster, and explains the frequent experience of one make of plaster causing more dermatitis than another.

In my experience in the treatment of ulcers and phlebitis of the legs with Elastoplast, dermatitis takes one of four forms.

1. Prickly heat from retained perspiration in hot weather.
2. Circular patches of dry eczema in the upper part of the leg.
3. A severe eczematous process around the ulcer where it seems that the combined effect of the discharge and the plaster is too much for the skin.
4. An acute allergic process not only affecting the whole leg and causing blisters of the feet, but also producing severe urticaria of face, neck, and forearms. This dermatitis may develop on the first application of the plaster, or may appear after some time owing to sensitisation occurring.

Types 1 and 2 can in most cases be ignored, and the plaster applied more tightly, or in nervous patients the elastoplast applied over a gauze bandage or a thin silk stocking. In type 3 I cover the ulcer and the surrounding skin with strips of Ceraban and then apply elastoplast over this. In type 4 elastoplast must at once be stopped and ceraban used; if then dermatitis persists, ichthopaste bandages; and if it still persists, crude coal tar ointment is applied under the ichthopaste bandages. I have also noticed that all forms of eczema are more likely to develop when the bandages are not applied tightly and evenly.

It must be emphasised that this complication of the treatment of gravitational conditions of the legs is not really serious, and I much regret that some writers have gone so far as to recommend the return to Unna's plaster on account of a rarely occurring complication which can be easily overcome. The application of Unna's plaster is a messy and laborious method of treatment which does not appeal to the busy practitioner or work well in hospital out-patient departments, and it must not be forgotten that Unna's plaster also produces at times a very intractable eczema. After seven years of treating ulcers with elastoplast I remain very satisfied with the results, and I keep constantly under treatment a much larger number of cases than could possibly be handled by any other method.

In superficial phlebitis the good results have to be seen to be believed; the gain to patients in comfort and time, and the expense saved, are such that I do not think the method can be improved upon or should be abandoned because of an occasional case of eczema.—I am, Sir, yours faithfully,

A. DICKSON WRIGHT.

Wimpole-street, W., August 28th.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—Dr. Thaysen in his interesting article states that he has found no mention of the above condition in the Danish, English, French, and American text-books and monographs to which he has access. A careful and accurate description of a condition which appears to be identical with proctalgia fugax was published in the *Glasgow Medical Journal* of September, 1917, by Mr. Alex. MacLennan, under the title, "A Short Note on Rectal Crises of Non-tabetic Origin." This article is based upon a considerable experience, and Mr. MacLennan concludes that "the lesion is certainly a neurosis, although it affects persons not of a neurotic temperament and otherwise in sound health." He recommends the use of chloroform vaporoles ℞3 (B.W. & Co.) during the attack.

I have had two such cases under my care, both males. In the first the attacks began at the age

of 16, and continued till he entered the Army at age 30. During his four years in the Army the attacks ceased entirely. On his return to civil life they recurred with extreme severity, and interfered seriously with his work as a tram-driver. Examination of the rectum under anæsthesia was negative. The attacks lessened in frequency and severity and disappeared some years ago. The second case was that of a man aged 37, married, with one child 10 years old. He had three attacks in two years. He indulged in coitus interruptus, and since this was stopped, a year ago, he has had no further attack.—I am, Sir, yours faithfully,

Bradford, August 22nd. PETER MCEWAN.

To the Editor of THE LANCET

SIR,—My attention was attracted by Dr. Thaysen's article to a case recently under my care.

The patient is a man, previously fit, who complains that he has lost weight for a few months. He also complains of easy fatiguability, anorexia, nausea, morning cough, and vomiting of mucus. During the last six to nine months he has had three or four attacks of pain just at the top of the anal canal. The pain he describes as gnawing or cramp-like, rising gradually to an unbearable crescendo. During the first attack, which lasted for an hour, he sought in all ways to obtain relief, by walking, defæcation, and the insertion of a finger in the rectum without amelioration or increase of pain. It was only with the adoption of a completely doubled-up squatting position with finger tips touching the floor that relief came. The position of defæcation did not apparently allow sufficient flexion for relief. The patient now aborts every attack in the manner described, so that no attack now lasts as long as the first.

Rectal inspection disclosed only a few very small piles, but on examination with the finger the muscular wall of the anal canal seemed to grasp the finger tightly, and when the finger tip touched the fibres of the levator ani surrounding it the patient said "That is the spot where I get the pain." It seems to me that a cramp of portions of the levator ani causes the symptoms (1) because the pain is analogous in character to muscular cramp elsewhere; (2) because of its tendency to spread and to involve the rest of the muscle, even "into the entire pelvic region"; (3) because it occurs, as in this case, during periods of fatigue; (4) because it is prone to arise in a muscle which has recently been excited—in Dr. Blyth's cases the symptoms followed masturbation; (5) because it appears when the patient is getting warm in bed, as happens with cramps in other parts; (6) because of its relief by stretching during the adoption of the squatting position.

I am, Sir, yours faithfully,

Ilford, Essex, August 28th. R. N. C. SMITH.

To the Editor of THE LANCET

SIR,—About 1904 when working in the pathological laboratory of a hospital the question of temporary pain in the rectum was raised, and at least five of those present were able to discuss the symptoms from personal experience. My brother and I were able to compare notes since both of us had had an attack of sufficient severity to cause loss of consciousness. Neither of us was able to attribute the attacks to any cause, nor were they more frequent when run down than when fresh from a holiday. In my own case about half the attacks followed defæcation before retiring; experience taught me that however pressing the desire to empty the bowel during an attack an attempt would aggravate the pain. The anal sphincter was not in spasm. Local heat was the only treatment which seemed to relieve.

Several of my patients seeking advice for some other trouble have told me that they suffered from this discomfort from time to time. It must be a fairly common complaint. Only three patients have sought my advice for it alone. One was a successful K.C., a very highly strung individual who had to cease appearing in court because he knew that rising to plead would bring on an attack. He could not believe that the pain was not due to a growth, and therefore he asked to be examined with a sigmoidoscope. This was arranged to be done under an anæsthetic at 4 P.M., and shortly before he said to me, "Is this not hard lines? For months I have had no appetite and just to-day at lunch when I was really hungry I was allowed only soup." The only female patient with the complaint had sought advice at many sources. Since the attacks were spoiling her life I advised treatment by suggestion. Although she toured Europe she did not succeed in finding any doctor who was able to hypnotise her.

The object of this letter is to seek information. Many of the subjects who have had these attacks have suffered from migraine. Migraine often ceases as age advances. In my own case the attacks have diminished in frequency and intensity pari passu with those of migraine; this suggests the possibility that it is a manifestation of that complaint. Many medical men have attacks of proctalgia fugax. May I ask them to inform you whether they have migraine too.

I am, Sir, yours faithfully,

August 27th. M. C. P.F.

BACTERIOLOGY OF RHEUMATISM

To the Editor of THE LANCET

SIR,—I should be greatly obliged to Prof. Douglas Wilkinson if he would publish the reference to the paper in 1886 in which Mantle "reported the *growth* of a diplococcus from the blood and joint fluid of a child with acute rheumatism." The word "growth" I have put in italics. I knew Dr. Mantle personally, and always gathered from him that he described and illustrated a diplococcus in the blood and advanced the theory that the disease was of microbic origin; important points which were given due credit in "Researches on Rheumatism" (p. 94). We (Poynton and Paine) however thought that in 1899 we first "grew in pure culture," and so isolated the diplococcus in this country. It is my duty, whatever is thought of this diplococcus, to correct in public the statement inferred in our work that we were the first to isolate and grow the diplococcus in this country if 13 years before this Mantle had succeeded.

I am, Sir, yours faithfully,

Bath, August 24th. F. JOHN POYNTON.

CERTIFICATION OF DEATH

To the Editor of THE LANCET

SIR,—Dr. Percy Stocks concludes his analysis (published in your issue of August 17th) by referring to the disappointment of the General Register Office at the failure of the new death certificate to improve definition in certification.

The form of certificate is not beyond criticism, but I wish here to draw attention to one way in which the registrar's desire for accurate information is defeated. Any person, on payment of a small fee, may inspect the supposedly secret certificate at the Registrar's Office, and industrial insurance companies regularly require that death claims should

be substantiated by the production of a copy. Frequently a working family is entirely dependent on insurance for the funeral expenses, and find that payment is withheld on the grounds that the certificate includes some conditions which may have existed before the policy was taken out. The fear of this is a constant cause of refusal of consent for autopsy. No medical examination is made before a proposal is accepted, a mere declaration of previous good health being required from persons who are almost wholly ignorant of medical terminology. A practitioner who knows that a morally justifiable claim may be legally defeated on such grounds will be sorely tempted to frame his certificate in such a way as to ensure justice at the expense of statistical accuracy.

A thorough inquiry into the conditions of so-called industrial insurance is, despite existing legislation, designed to protect insured persons from exploitation, highly necessary and long overdue. Benefits are quite disproportionate to the premiums required, overhead costs are scandalously high, and the profits made are considerable. I will give one instance from personal experience of the way in which the less scrupulous companies behave.

A child's life was insured as a result of canvassing by an agent at a time when the child was temporarily at home "on holiday" from a residential school for children with rheumatic heart disease, a fact well known to the agent. Later, the child died during another attack of acute rheumatism, and the certificate was entered as "Acute rheumatic carditis with previous chronic rheumatic carditis." The insurance company refused payment until the parents consulting me I threated publicity.

Incidentally, I would be obliged if the registrar would indicate how such a death can be accurately fitted into the rigid "due to" clauses of the present certificate.

I am, Sir, yours faithfully,

Birmingham, August 20th. DUNCAN LEYS.

THE DOSAGE OF ALKALI

To the Editor of THE LANCET

SIR,—In view of the facts published by Dr. Wilfrid Oakley in THE LANCET of July 27th (p. 187) under the heading of Alkalosis arising in Treatment of Peptic Ulcer, it is evident that the giving of alkali in the treatment of peptic ulceration needs close control. The formula of pulvis bismuthi compositus, which is indexed in the Extra Pharmacopœia of Martindale and Westcott (20th edition) under the heading of "MacLean's powder," is given as bismuth carbonate 2, sodium bicarbonate 1, magnesium carbonate (heavy) 2. The dose recommended for the first week is stated to be one teaspoonful six or seven times daily, with a double dose last thing at night, and extra powder during the night if the patient wakes. Thus one ounce of the powder may be given in 24 hours. A second formula (hospital formula) is given as bismuth carbonate 1, sodium bicarbonate 3, magnesium carbonate (heavy) 3, and creta preparata 3. One ounce of the former is equivalent to 47 grammes of alkali reckoned in terms of sodium bicarbonate, and one ounce of the latter (hospital formula) is equivalent to 40·6 grammes of sodium bicarbonate.

In Dr. Oakley's seven cases one that was fatal took an average daily quantity of 22·5 grammes over a period of four days, and another 38·6 grammes of sodium bicarbonate daily for fourteen days. Of the four cases that survived alkalosis the smallest daily intake was 23·4 grammes and the largest 54·8 grammes of sodium bicarbonate. It would seem therefore that the dose of pulvis bismuthi compositus is dangerously large, and that particularly in patients who are anæmic or vomiting anything approaching the dosage recommended should be given with caution.

I wish also to draw attention to Dr. Oakley's observation that five of his seven cases were given alkali in powder form. As he remarks, this allows of the possibility of much larger doses of alkali being taken than prescribed, because of the variation in the size and filling of the spoon used for measuring the dose of powder. On account of the inaccuracy of dosage when alkalis are prescribed in powder form it has always been my practice, and for 15 years my teaching in the out-patient department at St. Bartholomew's Hospital, to prescribe alkali in solution. The prescription that I use contains bismuth carbonate grs. 15, sodium bicarbonate grs. 10, heavy magnesium carbonate grs. 7½. It is given six times in 24 hours. Dr. Oakley tells me that its equivalent in sodium bicarbonate is 13 grammes. This quantity of alkali is the maximum daily intake, and as such is less than two-thirds of the minimum quantity that caused alkalosis in Dr. Oakley's series. During a long experience of the use of this prescription no patient has developed alkalosis while taking it, and it is my opinion that this quantity of alkali, combined with other treatment on well-established lines, is adequate. Dr. Oakley's observations make it clear how greatly the dosage of alkali prescribed for this complaint varies in the different wards of even the same hospital.

I am, Sir, yours faithfully,

GEOFFREY EVANS.

Mansfield-street, W., August 22nd.

SIGNIFICANCE OF PERSISTENT HIGH BLOOD PRESSURE

To the Editor of THE LANCET

SIR,—I am much interested to hear from Dr. Wauchope that she finds no contra-indication to the giving of insulin to diabetics with persistent hypertension. I shall certainly follow her advice in suitable cases. My contention that arterio-sclerotic hypertensives stand insulin badly does not rest on an isolated case. In addition to the one I quoted, I can recall that of an arterio-sclerotic man of 80 with diabetes mellitus complicated by cataract and retinitis who was definitely made worse by even 5-unit doses of insulin twice daily, and several similar experiences have been quoted to me by other doctors. Dr. Lawrence, I believe, goes so far as to say that he regards insulin as a substance toxic to arterio-sclerotic vessels, and I have heard Dr. Charles Miller express a similar view.

It seems to me possible that these cases fall into two groups. First, those with diabetes mellitus who later develop essential hypertension; secondly, those with essential hypertension who subsequently develop glycosuria. I suggest that Dr. Wauchope's cases belong to the first group and mine to the second. Unless (or until) a marked degree of arterio-sclerosis develops, insulin, I agree, should do nothing but good to the former. The diabetes which arises secondary to essential hypertension is, in my experience, relatively mild and responds readily to dieting without the use of insulin. The diet need not be a strictly diabetic one but should aim at reducing the patient's weight. With Dr. Wauchope's remarks about hypoglycæmia I also agree.

I am, Sir, yours faithfully,

Crediton, August 27th. L. N. JACKSON.

TISSUE EXTRACTS IN THE TREATMENT OF CANCER

To the Editor of THE LANCET

SIR,—I have continued my observations on the treatment of cancer with connective tissue extracts [1] and am able to record further good results obtained in inoperable cases. The hypothesis on which the treatment is based is, briefly, that carcinoma arises through failure of a factor which normally inhibits the overgrowth of cells. This inhibitory factor, it is suggested, is secreted by the connective tissue (whence it is discharged into the lymph) and acts most powerfully in the area where it is produced. Treatment is designed to bring this substance into contact with the cancerous cells, wherever they may be, by its intravenous injection; and any effect it may have should apply to secondary deposits just as much as to the primary growth. Experimental work published by Waterman [2] seemed to have a definite bearing on this theory, and since my report two years ago I have made a clinical trial of the tissue extract he described, subject to the modification that it was prepared from an area and an animal corresponding to that of the primary growth in the patient. The extract obtained, unlike that used previously,[1] is free from coagulable protein and relatively stable, and its active life seems to be about twelve weeks as compared with 7–10 days for the previous extracts.

A fellow worker having informed me of the results of some animal experiments he had carried out in an investigation of the value of iodine therapy in cancerous conditions, I made a clinical test of his preparation and found that it tended to relieve pain and to cause some recession of growth. As there was no antagonism between the two lines of treatment I have employed them in combination.*

With one exception all the 17 cases treated were patients in a public assistance hospital. They were all very severe and far beyond help from surgery or radium. The primary focus showed many variations. In no case was I responsible for the diagnosis, nor were the cases subject to any selection. In 6 cases the imminence of death prevented any hope that indications as to the value of treatment might be secured; of the remaining 11 none failed to show some benefit from treatment. Pain was constantly relieved, and 3 of these patients are now leading almost normal lives.

A group of 3, the only cases of prostatic carcinoma, produced perhaps the most remarkable improvement. They were all patients with suprapubic drainage, and none had passed water per urethram for some time, the periods being nine, five, and three months. In all of them normal micturition was secured by treatment. I regard the following case, admittedly the best, as very striking:—

The patient was a man of 80. In May, 1934, suprapubic drainage had been established for retention of urine due to a carcinoma of the prostate which was described as ++. In July, 1934, the condition had been explored and found to be quite inoperable; the growth had invaded the bladder and nothing was attempted. In January, 1935, he was referred to me for treatment. A daily intramuscular injection of iodine was given and gradually increased from 0·002 to 0·006 mg. Intravenous injections of prostatic extract (1–2 c.cm.) were given at intervals of four days. Within six weeks normal micturition was restored and became regular, and after a further month the suprapubic tube was removed. Three weeks later, early in April, the suprapubic wound healed. The patient was discharged from hospital in July, 1935, and was then reported as having no difficulty in micturition.

Great improvement was also secured in a case of universal rodent ulcer in a woman of 80, the lesions on the face being almost completely healed when treatment was brought to an end. The following case is another that deserves notice:—

Mrs. A., aged 47. Carcinoma of the cervix. She had first noticed a vaginal discharge in December, 1933. I first saw her in October, 1934. She had then been bedridden for fourteen weeks, complaining of severe pain, especially in the left leg, and a very offensive and profuse vaginal discharge. The bladder was distended, reaching nearly to the umbilicus, and per vaginam it was impossible to introduce one finger beyond the obstruction caused by the growth. The cervix could not be reached. Catheterisation yielded 14 oz. of urine plus a further 10 oz. of mucus on associated aspiration.

Treatment was with daily intramuscular injections of iodine up to a dosage of 0·004 mg. and with intravenous uterine extract up to 2·0 c.cm. at intervals of four days. After four weeks the pain and discharge were sufficiently diminished to allow of the patient's getting up. After a further six weeks the bladder was normal in size, pain was quite gone, discharge was negligible, and normal micturition was the rule. Per vaginam four fingers could be introduced and the cervix was readily felt.

Although it is believed—and this view is supported by clinical evidence—that the action of the inhibitory agent is more or less specific to its own area, it does not seem to be entirely inert elsewhere.

I have a patient with a large inoperable carcinoma, of uncertain origin, on the left side of the pelvis. As the primary focus was obscure she was treated with iodine 0·002 mg. intramuscularly each day and intravenous breast extract 1·0 c.cm. at weekly intervals. She had very severe and intractable pain. The abdomen was very tense and there was free fluid in it. She had œdema of both legs and was bedridden. A little œdema now persists in one leg. The patient is doing some gardening and leading an almost normal life. The other leg is quite normal and there is no ascites. Her pain is gone. It is interesting to note that her tumour is only slightly smaller, as checked by an independent consultant.

An important point emerges here however—namely, that the extract appears to exercise its inhibitory effect upon the blood-forming mechanism in some degree. To counteract this, liver cannot be used owing to its carcinogenic property, and accordingly hog's stomach was employed (as Ventriculin, in 10 g. doses daily by mouth) to combat any anæmia that might arise.

Dosage must be governed by the requirements of the particular case. In this series the optimum doses seemed to be up to 0·006 mg. of iodine intramuscularly and up to 2·5 c.cm. of the tissue extract intravenously. As the extract is practically protein-free the dose interval is not of paramount importance, but a period of 4–10 days between injections appeared to be suitable. Within the range of these doses no toxic effects need be apprehended.

I do not suggest that the cancerous condition treated by these means cannot possibly recur, but it should be possible to deal with a recurrence by the measures which were effective against the original tumour. Nor must it be thought that any precipitate claim is being entered as to cure. Amelioration is the rule if the case be not too far advanced. The two factors that militate against improvement seem to be anæmia and a large bulk of growth. It is for the latter reason that the hopeful aspect of

[1] Baker, H. S.: THE LANCET, 1933, ii., 643.
[2] Waterman, N., de Kromme, L., and Lemmens, J. F.: Untersuchungen über Cytolyse bei Krebs, Biochem. Zeits., 1929, ccv., 1.
* The preparations used can be obtained from Messrs. Research Products Ltd., of Henrietta-street, Strand, London, W.C.

treatment in cases of carcinoma of the prostate is emphasised, even though they be inoperable; for here a relatively small bulk of neoplasm will produce urgent symptoms. I am not as yet in a position to apportion the relative values of tissue extract and iodine in treatment.

I am, Sir, yours faithfully,

H. SEARLE BAKER.

Wimpole-street W., August 17th.

A FOREIGN BODY IN THE TONSIL

To the Editor of THE LANCET

SIR,—Four days ago I was asked to see a lady who complained of sore throat and thought she could see an ulcer on her left tonsil. On examining her I could see a grey-looking patch, covered with a little yellow exudation, in the upper pole of the left tonsil. It felt hard to the touch. With a pair of forceps I removed a small metallic mass the size of a pea and remarked "it looks like the stopping of a tooth." The patient then stated that in June she had lost a stopping and had been to her dentist, who laughingly had asked her if she had swallowed it. The case would appear to be worth recording for the following reasons: (1) That the stopping should have lodged in the tonsil and got buried in it. Presumably it must have happened while she was asleep. (2) That it should have remained there for over eight weeks. (3) That it should have caused so little local or general disturbance.

I am, Sir, yours faithfully,

W. JAMES SUSMAN.

Henley-on-Thames, August 24th.

PUBLIC HEALTH

Ministry of Health: a Jubilee Survey

THE sixteenth annual report[1] of the Ministry of Health, the last to be drawn up by Sir Arthur Robinson, follows the customary plan, with a special section dealing with public health services in London. In presenting it to the King the Minister, Sir Kingsley Wood, summarises the main developments during the last 25 years in regard to those services which now fall within his province. The creation in 1912 of the scheme of National Health Insurance takes pride of place, both chronologically and because of its importance. The vast expansion of the responsibilities of local authorities and the development of environmental health services (water-supply, housing, town-planning) and personal health services (tuberculosis, maternity and child welfare, general institutional provision, provision for the blind, mental treatment and mental deficiency) are then outlined. Paragraphs follow on public assistance, provision for postgraduate medical education, international health organisations, and advances in medical knowledge. In this connexion the Minister says that close and cordial relations must be maintained between his department and the Medical Research Council and also the medical staff of the public health service, "which has in the past played so great a part in the prevention of disease and must in the future also make a notable and increasing contribution to the general treatment of disease." Good relations, he adds, must also be maintained with the medical profession generally as the first line of defence against disease and disability. All will agree that the establishment and development of closer contacts between the State and the medical profession during the last 25 years are of good omen.

Deaths from Botulism in North London

At the final inquest held on August 23rd by the St. Pancras coroner, Mr. W. Bentley Purchase, the jury found that the three women died from botulism as the result of eating nut meat brawn, but that the man died from natural causes. He was the brother of one of the victims, and had eaten some of the same article of food, but Sir Bernard Spilsbury attributed his death to coronary artery disease. His death followed shortly after seeing his sister die in hospital. But there was, the coroner said, presumably a fourth death from botulism, that of a boy who partook of the same food in the house of one of the victims and had died later at his home outside London. Botulism was not at first suspected in his case, but after the autopsy it was regarded as the probable cause of death. The jury added a rider that under present regulations there was no neglect on the part of the manufacturers of the brawn. The coroner, endorsing this rider, remarked that in the future steps might have to be taken to avoid a recurrence. Dr. P. V. Pritchard, acting M.O.H. for St. Pancras, said that as far as the experimental evidence went it seemed that the infection came from an organism attached to some of the vegetables used in the brawn mixture, but which vegetable they had been unable to discover. For preparing this particular brawn peas and carrots had been freshly brought each morning from Covent Garden. It has been made for 29 years, and no previous case of botulism had been traced to it. In reply to a representative of the London Chamber of Commerce, Dr. Pritchard said he knew of no case of botulism which had occurred from food canned in this country or from canned food imported into this country from elsewhere. The deputy director of the Bristol food research station stated that botulism always existed as a danger, but could be combated by simple means which had been common knowledge in this country for at least twenty years. Britain produced from 150 to 200 million cans a year, and in reply to the coroner's question whether the *Bacillus botulinus* had ever successfully passed through the process and caused damage, he said there had been no instance in this country and none in America when those commercial processes had been carried out. All the British vegetable canners were, he said, using an absolutely safe process. Investigations by the Ministry of Health into the origin of the present cases are not yet completed.

Food Poisoning in East Lancashire

The number of cases of food poisoning reported in or near Nelson, Lancashire (see THE LANCET, July 20th, page 160), amounted in all to 174. Of the 7 deaths 3 occurred in Burnley and 4 in the Nelson area; 3 of the latter on July 4th, the fourth on July 22nd. In this case the illness began at the same time as in the other cases; after autopsy the cause of death was certified as toxic myocarditis attributable to food poisoning. Of the deaths in Burnley the first occurred on July 5th, and in this case there was direct evidence of the consumption of infected food in Nelson on July 1st. The second death occurred on July 16th in the Municipal Hospital,

[1] H.M. Stationery Office. Pp. 350. 5*s*. 6*d*.

the patient having been removed there from the Nelson area. Bacteriological investigation following post-mortem examination showed *B. aertrycke* to be present, but a definite linking up of this case with the infected food was not established. The third death at Burnley (also in the Municipal Hospital) occurred on July 20th; this patient was removed to the hospital from Nelson and the history of his illness was coincident with the other cases of food poisoning in Nelson. In each of the last three fatal cases the medical evidence showed some preceding depression of health. In all seven a verdict of accidental death was returned.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 24TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1553; diphtheria, 840; enteric fever, 61; acute pneumonia (primary or influenzal), 425; puerperal fever, 43; puerperal pyrexia, 134; cerebro-spinal fever, 13; acute poliomyelitis, 35; acute polio-encephalitis, 3; encephalitis lethargica, 7; dysentery, 21; ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 30th was 2525, which included: Scarlet fever, 730; diphtheria, 887; measles, 30; whooping-cough, 416; puerperal fever, 19 mothers (plus 4 babies); encephalitis lethargica, 270; poliomyelitis, 13. At St. Margaret's Hospital there were 23 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 4 (0) from measles, 5 (1) from scarlet fever, 22 (4) from whooping-cough, 19 (3) from diphtheria, 51 (12) from diarrhœa and enteritis under two years, and 9 (0) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were scattered over 26 great towns, the highest numbers being Hull and Liverpool each 4, Gateshead and Sunderland each 3, no other great town more than 2. Birmingham and Newport each reported 3 fatal cases of whooping-cough, Sunderland 2.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 41 per 1000 total births), including 29 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. A. G. Taylor to *President* for course; T. Madill to *Orion* as Squadron M.O.; and C. N. Ratcliffe to *Pembroke* for R.N. Hospital, Chatham.

Surg. Comdr. (Emergency List) G. H. S. Milln removed from Emergency List (non report).

Surg. Lt.-Comdr. M. Barton to be Surg. Comdr.

Surg. Lt.-Comdrs. G. Rorison to *Victory* for R.N.B., and J. Cussen to *Furious*.

Surg. Lts. W. J. M. Sadler to *St. Angelo* for R.N. Hospl., Malta; S. J. Wheeler to *President* for course; and G. S. Thoms to *Victory* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. A. Condon and Surg. Lt. D. R. Hughes to *Victory*.

Proby. Surg. Lt. W. G. Campbell to be Surg. Lt.

Proby. Surg. Lts. (D.) A. C. Fuller and J. Bunyan to be Surg. Lts. (D).

F. J. S. Gowar entered as Proby Surg. Lt.

Proby Surg. Sub-Lt. S. E. Cooke to *Pembroke* for R.N. Hospital, Chatham.

Proby Surg. Sub-Lts. to be Surg. Sub-Lts.: J. B. W. Hayward, P. H. K. Gray, and W. H. Osborn.

ARMY MEDICAL SERVICES

Maj.-Gen. (Supern.) J. W. West, C.B., C.M.G., C.B.E., M.B., M.Ch., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. and Bt.-Col. J. M. Weddell, F.R.C.S., K.H.S., from R.A.M.C., to be Col.

R.A.M. Coll.—Maj.-Gen. (Supern.) J. W. West, C.B., C.M.G., C.B.E., M.B., M.Ch., late R.A.M.C., relinquishes the appt. of Professor of Mil. Surgery and Consulting Surg. to the Army.

Col. J. M. Weddell, F.R.C.S., K.H.S., late R.A.M.C., to be Professor of Mil. Surgery and Consulting Surg. to the Army.

ROYAL ARMY MEDICAL CORPS

Maj. T. O. Thompson to be Lt.-Col.

Maj. H. C. Godding, M.C., is restd. to the estabt.

Short Serv. Commissions.—Lt. (on prob.) D. N. Keys is restd. to the estabt.

SUPPLEMENTARY RESERVE OF OFFICERS

E. T. St. M. Brett to be Lt.

ARMY DENTAL CORPS

The undermentioned are granted temp. commissions in the rank of Lt.: J. H. Sherwen and C. W. Upton.

TERRITORIAL ARMY

Lts. F. S. M. Heggs and T. A. L. Davies to be Capts.

Supernumerary for service with the O.T.C.—Lt. R. W. Rattray resigns his commission.

W. I. C. Morris, M.B., F.R.C.S. Edin. (late Offr. Cadet C.Q.M.S., Edinburgh Univ. Contgt., Sen. Div., O.T.C.), to be Lt. for duty with the Med. Unit of that Contgt., July 2nd, 1935. (Substituted for the notification in the *Gazette* of July 19th, 1935.)

Capt. B. Reid resigns his commn.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. F. H. Taylor, from Active List, to be Capt.

ROYAL AIR FORCE

Wing Comdrs. T. J. Thomas to R.A.F. Station, Calshot, for duty as Medical Officer.

Flight Lts. C. G. Harold to Medical Training Depôt, Halton, and G. O. Williams to Central Medical Establishment.

RESERVE OF AIR FORCE OFFICERS

L. V. McNabb is granted a commission as Flying Offr. in class DD.

INDIAN MEDICAL SERVICE

The undermentioned officers retire: Maj.-Gens. Sir R. McCarrison, Kt., C.I.E., K.H.P., and H. R. Nutt, M.D., F.R.C.S., K.H.S.

DEATHS IN THE SERVICES

The death occurred on Sept. 1st of Lieut.-Col. James Dorgan, R.A.M.C. (retd.). He was born in County Cork and educated at Clongowes and Queen's College, Cork. He qualified as M.B. R.U.I. in 1898 and entered the R.A.M.C. two years later, becoming major in 1912 when he was stationed at Hong-Kong. He had taken the diplomas of D.P.H. and D.T.M. and early in the war had to deal with a large epidemic of cerebro-spinal fever which gave him the opportunity of investigating the carrier problem. This work was published in our columns (THE LANCET, 1919, ii., 97) when Lieut.-Colonel Dorgan was studying carrier problems in Mesopotamia. His death occurred at Southport where he was living in retirement.

ISOLATION HOSPITALS.—Cheshire county council has prepared a scheme to take over the isolation hospitals in the county which is to be divided into six areas for one hospital. The hospitals would be controlled by a standing committee composed of two-thirds of members of the county council and one-third members of local authorities.

OBITUARY

HUGH WILLIAM ACTON, C.I.E., M.R.C.S. Eng.

THE death of Colonel Acton, briefly announced in our columns last week, deprives the Indian Medical Service of one of its ornaments and tropical medicine of an earnest and successful investigator. It was said of him that he had the ability to look further through a brick wall than anyone else.

Hugh William Acton was born in 1883 in Calcutta where his father owned the Caledonian printing press. He was sent to England for his education, studying medicine at the Middlesex Hospital from which he qualified in 1905. He was house physician there and clinical assistant at the Chelsea Hospital for Women before entering the Indian Medical Service, which he did in July, 1907. He was sent to the frontier to assist Captain J. Woods as medical officer of the 53rd Sikhs at Peshawar, but in 1910 he was given work more congenial to his temperament, becoming assistant director of the Pasteur Institute at Kasauli, then the principal centre for antirabic treatment in India. Still nominally in military employ he was sent to Mesopotamia in May, 1916, and on his release with the rank of major in 1921 he was appointed to the chair of tropical pathology and bacteriology in the newly founded school of tropical medicine at Calcutta. It was then that was revealed the versatility of the man, for during the next 12 years he occupied the chair of helminthology, took charge of the department of dermatology, was director of the school for the larger part of the time, and throughout in charge of beds at the Carmichael Hospital. When invalided home from India two years ago it was hoped that he would soon return, but these hopes were disappointed.

[*Photograph by Valentine*

COLONEL ACTON

The recent annual report by his deputy bears witness to Acton's ability as teacher and demonstrator. He had the gift of clear and precise exposition, with the touch of dogmatism desirable in the instruction of undergraduates, but always with a readiness to give chapter and verse for novel and stimulating views. He was an ideal administrator, knowing from inside what was to be expected from the various departments of the school, and in medical research he had few contemporary rivals. His ability to grasp the essentials of a problem, to map out the lines of investigation, and to coördinate the results were combined with a lively and inquiring mind. His work with Curjel and Dewey on the treatment of tertian fever when in charge of the malarial research laboratory at Dagshai was the first serious work on the action of cinchona alkaloids on malarial parasites, and was followed by further work at the National Institute of Medical Research in which he showed the relation in these alkaloids of chemical formula to optical and therapeutic activity. He demonstrated for instance that the efficacy of cinchona febrifuge depended on the presence of quinidine, and he was successful in tracking down the cause of the toxic effects when quinine is administered intravenously and intramuscularly. His book on the dysenteries of India (1928), written jointly with R. Knowles, sets out advances made in handling these plagues during and since the war. The study filled a real gap, for dysentery has not as yet been the subject of a research expedition such as those organised against kala-azar and plague. More recently his theory of entamœba carriers led to a lively discussion at the Royal Society of Tropical Medicine; Acton held the view that there were two classes of carriers, one with lesions and one without, the former common in India and the tropics, the latter in the temperate zone. This is only to mention a few directions in which his investigations gave practical results; they also covered snake venom, lathyrism, epidemic dropsy, and many aspects of protozoology. His legacy to the school of a department of mycology is a reminder of how Acton helped to introduce order into one of the most confused subjects in tropical medicine.

Sir John Megaw writes: "From the outset Acton's interests lay chiefly in research and at an early stage in his career he collaborated with Colonel Knowles in a brilliant piece of work on snakes and snake venom. This investigation was only the beginning of a long and happy association between Acton and Knowles who remained firm friends as well as colleagues during their long stay at the Calcutta school. Acton's numerous publications testify to his ability as a versatile and original worker, but they do not by any means tell the whole story of his influence on medical research in India. Acton's brain was remarkably prolific in ideas, but most of these were communicated to his colleagues and assistants—to the great benefit of their research work. He was a natural leader of men, and commanded the admiration of his associates to such an extent that their unquestioning acceptance of his views was almost a handicap in his work. His premature death is a heavy blow to his former colleagues and assistants as well as to a large circle of other personal friends."

Colonel Acton married in 1911 May Louise Jacobs and leaves a widow and two sons, one of whom is a medical student.

GEORGE HERBERT MORRISON, M.B. Edin.

Dr. G. H. Morrison, whose death from injuries on August 23rd we announced last week, was elder son of the late G. H. Morrison, sometime moderator of the United Free Church of Scotland, and was born in Glasgow in 1898. He received his early education at Glasgow Academy, and was on a cycling tour in Germany when war broke out in August, 1914. He was able to reach friends in Mecklenburg-Schwerin, at whose house he had acted as tutor during the summer vacation, and after the internment regulations came into force he was sent to the civilian camp at Ruhleben. There he remained until January, 1918, when after a serious illness he was exchanged and sent home. He was thus 20 years old when he began to study medicine at Edinburgh University, where his ability and wit made him notable as a debater at the Royal Medical Society and as editor

of the *Student*, the undergraduate weekly. On qualifying in 1923 he joined the editorial staff of THE LANCET for two years; then for a time he returned to clinical work, gaining experience by resident posts at the National Temperance Hospital, and as clinical assistant at the Royal Edinburgh Mental Hospital. After a period of general practice he was appointed medical adviser to Bayer Products Ltd. and editor of "Clinical Excerpts," and in these capacities did much to bring the results of German medical and pharmacological research before the medical profession in this country. Morrison was ready and successful in friendship, and among his wide acquaintance had a well-deserved reputation as a maker of pungent and amusing phrases. His verses were published in *Country Life* and elsewhere, and he was the founder of the King James VI. Society, a flourishing dining-club of Scottish university men. He leaves a widow and a young son.

ANDREW FULLER, L.R.C.P. Edin.

Dr. Andrew Fuller, who died at Perranporth, Cornwall, at the age of 76, was for many years medical inspector for poor-law services under the Local Government Board and Ministry of Health. Born at Codsall in 1859, the son of William M. Fuller, one of the organisers of the Y.M.C.A., Andrew Fuller was educated at Wolverhampton Grammar School and Birmingham University, taking his medical course partly at Queen's College and partly at Edinburgh, from which he qualified in 1882. He was then resident medical assistant at the General Hospital, Birmingham, before entering general practice at Bugbrooke, Northants, which he gave up in 1893 to accept the post at the Local Government Board. Here he was in charge of the care, feeding, and training of pauper children, and of the provision of trained nursing staff for the poor-law service. He was responsible for many improvements in dietary and initiated the systematic medical examination of children in the poor-law schools. He was one of the principal witnesses before the Royal Commission (1909) on the Poor Law, and was associated with Morant in an abortive scheme for coördinating the voluntary and poor-law hospitals. In large measure he deserves credit for the improvement in the character of the hospitals before they became municipalised. During the war Dr. Fuller examined for compensation the victims of air raids, and just before his retirement he was examining the blind for the Home Office. On leaving the public service in 1921 he bought a practice at Perranporth, in which he was joined by Dr. Andrew R. Fuller. Dr. Fuller married Emily Beatrice Lois, daughter of Charles Berry. Another of their sons is Dr. C. B. S. Fuller of Winchester. Mrs. Fuller is a justice of the peace for Cornwall.

Dr. SEAN O'DEA, who died on August 27th, was county medical officer of health for Donegal. A native of County Clare, he qualified M.B. N.U.I. in 1923, and served for a time as a medical officer in the army of the Irish Free State. After taking the D.P.H. in 1926 he spent some time at public health work in England, and five years ago was appointed the first medical officer for Donegal. He had much pioneer work to undertake, but succeeded in laying the foundations of a sound administrative system. In October last he married Dr. Attracta Halpenny, pathologist to the Richmond Hospital, Dublin, and much sympathy is felt for her by a large circle of friends.

MEDICAL NEWS

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp.; H. Firman, Univ. of Manch.; N. R. James, London Hosp.; E. E. Le Feuvre, St. Mary's Hosp.; R. A. McMillan, Middlesex Hosp.; F. R. Neubert, Univ. of Liverp.; S. E. Osborne, Guy's Hosp.; and J. E. G. Wright, Queen's, Univ. of Belf., and Westminster Hosp.

Medicine.—E. L. Burgess, King's Coll. Hosp.; J. A. Carter, Univ. of Camb. and London Hosp.; E. M. Craggs, Middlesex Hosp.; H. Firman, Univ. of Manch.; R. G. Joyce, Welsh National School of Medicine; H. N. Levitt, Guy's Hosp.; and F. R. Neubert, Univ. of Liverp.

Forensic Medicine.—E. M. Craggs, Middlesex Hosp.; H. Firman, Univ. of Manch.; H. W. John, St. Mary's Hosp.; and F. R. Neubert, Univ. of Liverp.

Midwifery.—H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp.; J. E. Garson, Univ. of Madras and West London Hosp.; A. Morgan, Univ. of Manch.; M. A. Partridge, Guy's Hosp.; and S. Roberts, Univ. of Bristol.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: E. L. Burgess, J. A. Carter, H. N. Davis, J. E. Garson, R. G. Joyce, H. N. Levitt, S. E. Osborne, S. Roberts, and J. E. G. Wright.

University of Glasgow

Dr. Duncan Blair, professor of anatomy and dean of the medical school at King's College, University of London, has been appointed regius professor of anatomy in the University in succession to Prof. T. H. Bryce, who has resigned.

Duncan MacCallum Blair was born in 1896 and educated at Woodside School, Glasgow, and Glasgow University. From 1915 to 1917 he broke into his medical studies to serve as surgeon sub-lieutenant with the R.N.V.R. and returned to Glasgow to graduate M.B. with honours in 1919. In the same year he became demonstrator of anatomy in the University, later proceeding to London, where he held the John Hunter lectureship in applied anatomy at St. George's Hospital medical school until 1927, when he was appointed to his present post. In 1923 Dr. Blair was awarded the Symington prize. He is the author of the section on arthrology in the 6th edition of Cunningham's Text-book of Anatomy, and has of recent years devoted much attention to the study of neurohistology by means of infra-red photography.

University of Birmingham

In connexion with the opening of the session in October, it has been arranged to hold a series of post-graduate lectures at the General, Queen's, and Children's Hospitals, for old students of the school on Friday and Saturday, Oct. 11th and 12th. Sir Walter Langdon-Brown will give an address on Friday in the medical theatre, Edmund-street, and the annual dinner will be held at the Grand Hotel at 8.15 on the same evening. Further particulars may be had on application to the dean.

London School of Dermatology

The Chesterfield lectures, which constitute a systematic course in dermatology, will be given at 5 P.M. during October and November, and January and February. An examination will be held at the end of the course in March and the Chesterfield medal will be awarded. There will be out-patient clinics daily. Medical practitioners will be welcome as occasional visitors on presentation of their cards. Further particulars may be had from the dean of the school, St. John's Hospital for Diseases of the Skin, Leicester-square, London, W.C.2.

Auxiliary Courses for D.P.H.

A three months' course of lectures and demonstrations on clinical practice and in hospital administration for candidates for the D.P.H. will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., by Dr. A. Joe, the medical superintendent, on Mondays and Wednesdays at 9.30 A.M. and alternate Saturdays at a time to be arranged, beginning on Monday, Sept. 30th. A similar course will be given at the Brook Hospital, Shooter's Hill, Woolwich, S.E., at the same times by Dr. J. V. Armstrong, the medical superintendent, beginning on Monday, Oct. 7th. Applications should be made to the medical officer of health, London County Council, Public Health Department (Special Hospitals), The County Hall, S.E.1.

Dr. A. M. W. Rae, senior medical officer, has been appointed a member of the executive council of the Gambia and an official member of the legislative council.

Dr. H. Harold Scott, assistant director of the Bureau of Hygiene and Tropical Disease, has been appointed director in succession to Sir Arthur Bagshawe, who has retired.

Typhoid Fever in Belfast

The public health committee of Belfast was summoned at the week-end to consider an outbreak of typhoid fever in the Greencastle area of the city. Forty-one cases have been reported, and it is believed that the epidemic is caused by milk, most of the cases having occurred on a particular milk round.

Coventry and Warwickshire Hospital

The board of management of this hospital has decided to begin at once with the first two sections of their extension scheme at an estimated cost of £86,000. This will provide for 69 and 54 beds for patients and 69 beds for nurses.

Hospitals in Newcastle

The Newcastle-upon-Tyne corporation has undertaken to spend £70,000 on extensions to the hospitals under its jurisdiction. Some institutions in the city are full to overflowing, while others have difficulty in filling beds. It has been suggested that a number of the smaller hospitals should be closed and a large new hospital erected.

C.S.M.M.G. Congress

Several medical men are to address the members' congress of the Chartered Society of Massage and Medical Gymnastics to be held at Harrogate from Sept. 18th to 21st. Dr. W. Edgecombe will speak on the Spa Treatment of Rheumatism, Mr. R. Broomhead, F.R.C.S., will give a lantern lecture on Some American Orthopædic Clinics, Dr. F. W. Eurich will speak on Functional Disorders and Malingering, Dr. W. H. Maxwell Telling on Some Points in the Diagnosis and Treatment of Fibrositis, Dr. W. J. Turrell on Short Wave Therapy, Mr. C. Gordon Erwin will give a lantern lecture on Bone Regeneration, and Mr. Basil Hughes will speak on Surgical Developments in connexion with the Sympathetic Nervous System. The founders' lecture will be delivered by Prof. H. H. Woollard, M.D., on Nerves and Vessels of the Skin. All the lectures will be given in the spa rooms, and the annual dinner will be held at the Grand Hotel on the Friday evening.

Fellowship of Medicine and Post-Graduate Medical Association

A post-graduate course in medicine and surgery for men only will be held at the Westminster Hospital from Sept. 16th to 28th. Other courses during September include a course in chest diseases at the Brompton Hospital (Sept. 23rd to 28th); a special M.R.C.P. class at the Brompton Hospital (twice weekly at 5 P.M., from Sept. 10th to Oct. 4th); a week-end course in ophthalmology at the Royal Westminster Ophthalmic Hospital (Sept. 28th and 29th); a course in proctology at the Gordon Hospital (Sept. 30th to Oct. 5th); evening clinical and pathological class for M.R.C.P. candidates at the National Temperance Hospital (Tuesdays and Thursdays at 8 P.M., Sept. 10th to 26th); and a course on the interpretation of X rays at the Medical Society of London lecture room (Sept. 30th to Oct. 4th, at 5 P.M.). Further courses to be given are dermatology at St. John's Hospital (Sept. 30th to Oct. 31st, afternoons); anatomy and physiology at the Infants Hospital (Mondays, Wednesdays, and Fridays at 8 P.M., from Oct. 7th to Nov. 29th); endocrinology at the National Temperance Hospital (Tuesdays and Thursdays at 8.30 P.M., Oct. 8th to 24th); gynæcology at the Medical Society of London (4 P.M. once weekly, Oct. 10th to Nov. 7th); and fevers at the Park Hospital (Oct. 5th and 6th). Detailed syllabuses can be obtained from the secretary of the Fellowship, 1, Wimpole-street, W. 1. Courses are open only to members.

Out-patients at Ipswich

The East Suffolk and Ipswich Hospital is to have its out-patients' department extended, and an attempt is being made to eliminate the attendance of chronic cases. It is hoped that the development of the appointment system will prevent much waste of time. This system has already been started in the casualty department where each patient is handed a card for subsequent attendances. During an experimental period no patient has had to wait longer than ten minutes.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 9th, to SATURDAY, Sept. 14th.—INFANTS HOSPITAL, Vincent-square, S.W. Afternoon post-graduate course in infants' diseases.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M.: Clinical and pathological class.—ROYAL CHEST HOSPITAL, City-road, E.C. Mon., Wed., and Fri., 8 P.M.: Class in heart and lung diseases.

SOCIETIES

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Sept. 10th.—9 P.M. (Great Western Royal Hotel, Paddington), Mr. A. Dickson Wright: Sclerosing Injection Treatment in General Practice.

Appointments

JOHNSON, P. DUNBAR, M.R.C.S. Eng., has been appointed Hon. Anæsthetist to the Buchanan Hospital, St. Leonards-on-Sea.

LANYON, C. B., M.D. Lond., Senior Resident Medical Officer at the Queen's Hospital for Children, London.

SLOT, GERALD, M.D., M.R.C.P. Lond., D.P.H., Hon. Physician to the Buchanan Hospital, St. Leonards-on-Sea.

Medical Referee under the Workmen's Compensation Act, 1925: JAMES LAW FALCONER, M.B., F.R.C.S., of Bolton, for Bolton (Circuit No. 5) and Wigan (Circuit No. 6) County Court Districts.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On August 26th, at Glasgow, the wife of Frank E. Anderson, M.B. St. And., Sudan Medical Service, of a son.

BLAUVELT.—On August 24th, at Neville-street, S.W., the wife of Hugh O. Blauvelt, F.R.C.S. Eng., of a daughter.

COLES.—On August 25th, at Bentinck-street, W., the wife of Bennett Coles, M.R.C.S. Eng., Uxbridge, of a son.

EVERETT.—On August 29th, at Leatherhead, the wife of A. D. Everett, F.R.C.S. Eng., of a son.

PAUL.—On August 28th, at Welbeck-street, W., the wife of Saville Paul, M.R.C.S. Eng., of Kingsbury, N.W., of a daughter.

WELDON.—On August 23rd, at a nursing-home, Wexford, the wife of Surg.-Lt. Comdr. S. G. Weldon, M.B. Dub., Royal Navy, of a son.

WILLIAMSON.—On August 27th, at Hythe, the wife of S. T. Williamson, M.R.C.S. Eng., of a daughter.

MARRIAGES

TURNER—COULDREY.—On August 28th, at St. Augustine's, Kilburn, Cyril Edward Hedgman Turner, M.R.C.S. Eng., to Marjorie, elder daughter of Mr. and Mrs. Arthur Couldrey of Bloomsbury.

DEATHS

MACDONALD.—On August 25th, Alderman George Godfrey Macdonald, M.D. Glasg., J.P., at Crich, near Matlock, aged 74.

MORTON.—On August 26th, at a nursing-home, Shadforth Morton, M.D. Durh., M.R.C.S. Eng., of Henfield, Sussex (sometime consulting physician, Croydon General Hospital), in his 80th year.

REID.—On Sept. 1st, at St. Helens, James Reid, M.B. Edin.

TAGGART.—On August 29th, 1935, following an accident at her residence "Peel Moat House," Heaton Moor, Stockport, Alice Emily, the dearly loved wife of Dr. J. Scott Taggart, aged 62 years.

WILLS.—On Sept. 1st, at Canterbury, Reginald Graham Wills, M.D. Aberd., aged 71.

WORRALL.—On August 25th, Edward S. Worrall, M.R.C.S. Eng., of Crouch Hill, N.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE MEASUREMENT OF ULTRA-VIOLET RADIATION IN DAYLIGHT

By J. S. Owens, M.D., A.M.I.C.E.

SUPERINTENDENT OF OBSERVATIONS ON ATMOSPHERIC POLLUTION, DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

THE growing appreciation by physiologists of the value of ultra-violet radiation and the need for some simple means of measurement has prompted me to devise the apparatus described below. The principle upon which it is based has been tried before in different forms, and usually involves the use of an optical wedge. This admits light to a sensitised paper above which is an opaque plate having a row of small holes, and the amount of light reaching the paper through these holes is graduated by the superimposed wedge or its equivalent. We should thus get, with a bright illumination, a greater number of spots on the paper than with a faint illumination, and the number of spots becomes a measure of the amount of light falling on the apparatus. There are, however, serious difficulties in finding an optical wedge suited for use with ultra-violet light, and several methods which have been tried have failed owing to this. A gelatin wedge could be made which would fulfil the purpose, but unfortunately it is not permanent and varies in its transmission with humidity and so on, while it is not easy to make a number of wedges exactly similar.

FIG. 1.—Apparatus mounted at an angle of 45°.

THE APPARATUS

The apparatus now described consists of a series of tubes, about ½ in. bore and 6 in. long. These are dead black inside and are arranged in a series of concentric circles. The tubes terminate at the bottom in a plate having a small hole about 3/16 in. diameter in the axis of each. All these holes are the same diameter, and an arrangement similar to an ordinary printing frame permits a piece of sensitised paper to be held close against this perforated plate. The upper ends of these tubes or cells terminate in 13 holes of different diameter, ranging from about 10 mm. down to 0·7 mm.—i.e., from 200 to 1 in area. Over these is placed a piece of ultra-violet glass, such as Chance's No. 14, which transmits nearly all the ultra-violet rays between 3000 and 4000 A.U.

When this apparatus is exposed to daylight, the sensitised paper at the bottom of each cell receives an amount of light which is proportional to the area of the top hole, since all the tubes or cells are the same length. The light received is also inversely proportional to the square of the height of the cell, but this does not affect the present description, since the cells are all the same height. It provides, however, a useful means of adjusting the dimensions, so that the scale of sensitiveness may cover all probable conditions. It is known that the ultra-violet light which reaches the earth is not much, if anything, under 3000 A.U. owing to absorption by the atmosphere, hence there is no advantage in attempting to record wave-lengths below this. The apparatus may be mounted in a vertical position, pointing at the zenith; in this country it does not receive direct sunlight in this position. It is probably better, however, to mount it at an angle of 45° pointing north, as shown in Fig. 1, when comparable results for any country could be obtained.

It is designed for a whole day's exposure, and the scale is such that the brightest and longest day just gives a visible spot under the smallest hole, or perhaps the second smallest hole, while the darkest and shortest day gives a spot under the largest or some smaller hole. After exposure for 24 hours the number of visible spots is noted, not their intensity or darkness, and this number, referred to a scale, gives a measure of the intensity of ultra-violet radiation from the sky.

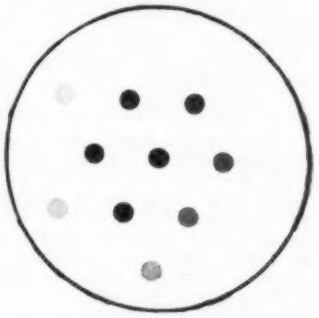

FIG. 2.—Sample record.

A = Cell number. B = Diameter of opening in mm. C = Scale reading based on cell showing just visible spot (paper not fixed).

A	B	C	A	B	C
1	10	1·00	8	3	11·10
2	9	1·23	9	2·5	16·00
3	8	1·56	10	2	25·00
4	7	2·04	11	1·4	51·00
5	6	2·78	12	1	100·00
6	5	4·00	13	0·7	204·00
7	4	6·25			

The unit is an arbitrary one—i.e., the amount of ultra-violet light required to give a just visible spot under the cell having the largest top opening. We have, in effect, an optical wedge without any material wedge to vary, the quantity of light received being determined by dimensions alone. No calibration is required, and hence it is easy to make a number of instruments exactly similar. This is important when the instrument is used to compare the amount of ultra-violet radiation received at different places—e.g., in the centre of a smoky city and at the seaside.

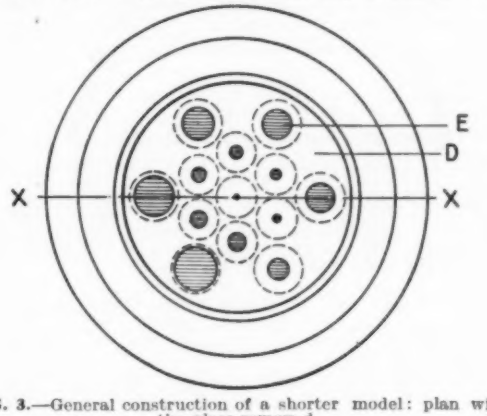

FIG. 3.—General construction of a shorter model: plan with the glass removed.

The sort of record obtained from the instrument is shown in Fig. 2 in which there are 10 spots visible. Reference to the Table gives the amount of ultra-violet radiation as 25. The sensitised paper used is Kodak Kodatone, and I find it preferable to read the record without fixing, which introduces a complication owing to fading, so that the amount of light recorded is only about one-third of that before fixing.

Figs. 3, 4, and 5 show the general construction of the apparatus, but the model is a shorter one than that shown in Fig. 1, and the scale and unit are different. It was found to be too sensitive, hence the length of cells was increased. This shows the simple way in which the sensitivity can be adjusted when fixing the most suitable range for a standard instrument.

THE THEORETICAL BASIS

The basic assumptions in this apparatus are that a paper of sufficiently uniform sensitiveness can be obtained, and that the effect of ultra-violet radiation upon this paper is in proportion to the intensity multiplied by the time of exposure. This last requirement involved checking the effect of what is known by photographers as "reciprocity," or proving that the effect of a uniform light was proportional to the time of exposure. Experiments showed that such an assumption might be made without introducing any important error.

The principle may be summarised in a few words thus. If the sensitised paper requires a definite amount of light to produce a just visible spot, it follows that for the same exposure to different light intensities the area of hole admitting light to the cell under which a just visible spot appears will be inversely as the illumination. Conversely, and since we wish to measure the intensity of the illumination, if we know the area of hole under which a just visible spot appears, after standard exposure, the intensity of illumination will be inversely as the area of this hole. For example, if in one case there is just enough light to make a visible spot

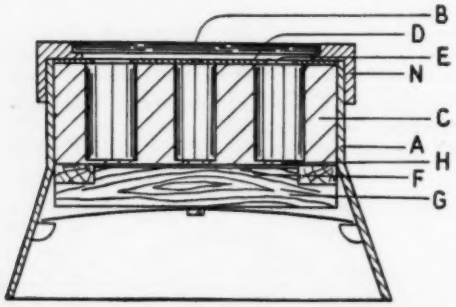

FIG. 4.—Vertical section of the same, taken through X—X in Fig. 3.

A, outer case; B, ultra-violet glass; C, block in which cells are formed; D, top plate showing holes of different diameter; E, hole in top plate over a cell; F, recess for sensitised paper; G, removable pad, as in printing frame; H, hole at bottom of a cell; N, cap for holding ultra-violet glass.

under a hole of 50 units area, while in another there is enough to make a spot under a hole of 25 units area, the intensity in the latter case will be double that in the former.

The instrument itself is robust and weatherproof and can be left out in all conditions of weather, the record paper being changed and read each day. It was felt desirable to exclude the effect of direct sunlight and aim at measuring skylight only. Any attempt to include light from the whole sky is subject to the drawback that the result would be governed partly by the area of sky visible from the point of exposure; such an apparatus could not be used amongst buildings where much of the sky is cut off. Experiments made to bring out this point showed that near an obstacle such as a house the light received under an opal dome fell off rapidly. For example, at 10 ft. from a house the reading was 12·5 units, while at 40 ft. it was 17·5. Similarly, near a tree, the reading was 28 units at 10 ft. away, while at 20 ft. it was 37, and at 50 ft. 42. These units are candle power received on the photo-electric cell of a Holophane Edgcumbe auto-photometer, placed under an opal bowl 17 cm. in diameter.

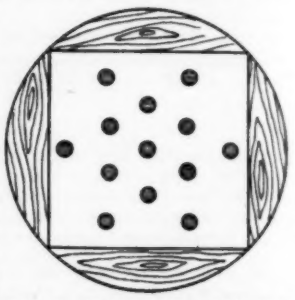

FIG. 5.—Bottom view of block C showing holes H and recess F.

Direct sunlight can be included, if desired, in an instrument exposed to the zenith, by using a diffusing or ground surface on the ultra-violet glass. This will not of course give the whole of the sunshine, but only a fixed proportion. Similarly, a certain amount is lost by reflection from the glass surfaces, but if the proportion so lost is constant for all instruments, it would not affect comparative figures and would be taken account of in any calibration made to find the absolute value of the unit of the apparatus. Such a complication however seemed unnecessary, an arbitrary unit being just as good as an absolute one for the purpose in hand.

An interesting anomaly indicated by observations with this instrument is that the ultra-violet radiation received from the sky is often actually increased by the presence of clouds, which catch and reflect the light from the sun.

RICHARD LOWER AND JOHN MAYOW

Dr. J. F. Fulton, Sterling professor of physiology in the School of Medicine of Yale University, has compiled, with pertinent and learned comment, bibliographies of the writings of the two famous Oxford physiologists, Richard Lower and John Mayow, who flourished in the latter half of the seventeenth century. The work reaches us as a reprint from the proceedings of the Oxford Bibliographical Society, and Dr. Fulton, who has already published through the same medium a bibliography of the works of Robert Boyle, promises to give the same valuable attention to Willis, Hooke, and others who played a prominent part in Oxford science during the Restoration. Oxford scholars and their contemporaries in the seventeenth century were greedy of knowledge, and it emerges from Dr. Fulton's studies that both Lower and Mayow were appreciated in their time, their work being discussed both during their lives and after they had died. Dr. Fulton finds, in accord with the view already expressed by Prof. T. S. Patterson of Glasgow, that Mayow was rather an enthusiastic student, summarising uncritical views held by others and contributing little himself, while Lower was an independent and painstaking investigator.

Lower is well known as the champion of the great Thomas Willis, whose assistant he was. But his treatise on the motion of the heart and the colour of the blood was an original work, as was his proof that the venous blood becomes red on passing through the lungs by virtue of being brought into contact with the air; this was the chief glory of his scientific career, though not his only contribution to learning. The treatise "De Corde" appeared in 1669, was published simultaneously in London and Amsterdam, and between its first issue and 1749 was reissued at least 12 times, while in 1932 it was republished at Oxford. To the second edition of "De Corde" there is an appendix on the origin of catarrh, and Dr. Fulton notes that the references in other literature

to this work are usually to the form appended to the "De Corde," while there is evidence that several separate editions of the tractate were published. Lower's other well-known work entitled "Bromographia" is mainly an essay on the use of infusions of barley in medicine. This work appears also to have run through many editions, as issued from various continental, chiefly German, centres, but presumably met with no success in London. The bibliography closes with notes on the many references to Lower and his work occurring in scientific literature or in biographies, and adds an extraordinary elegy dedicated to him. They could certainly in the seventeenth century spread the adulation thickly, for the elegy closes as follows:—

"And Reader, now wouldst thou his Equal know,
Go follow him, for there's none left below;
Go, follow to that Blessed Place Above,
Where all your Admiration will be Love."

Mayow, whose name sounds the more familiar of the two, owes his fame to his "Tractatus Quinque" which was published after Lower had written "De Corde" and also after the famous experiments of Boyle, Hooke, and others on the respiration had appeared. There seems little doubt that much of Mayow's reputation has been due to the work of others. But Prof. Patterson, while allowing that much of the work on respiration attributed to Mayow was not original, still finds things in the "Tractatus Quinque" which had not been previously described. He points out that Mayow did in an ingenious manner show that what we call hydrogen and nitric oxide expand in the same kind of way as air: that is to say, obey Boyle's Law. And Dr. Fulton finds that Mayow cannot be adequately visualised unless one makes allowances for his youth. When still in his teens he was fired by the new scientific spirit which was abroad in Oxford, and he has left a creditable record of what was going on about him.

It is good to note the close and learned interest which is now being taken in the history of medicine, for undoubtedly the course of medical thought is often directed usefully by knowledge of the theories and exploits, successes and failures of past leaders.

A PILGRIMAGE TO MENTAL HOSPITALS

THIS story of a laywoman's pilgrimage through the mental hospitals of France, Belgium, and Holland[1] provides a useful sidelight on environmental conditions. In the mental hospitals of Belgium visited, most of which are connected with religious nursing orders, Miss Hankin was particularly impressed by the devotion of the nursing sisters and by the attitude of friendliness and affection obtaining between patients and nurses. She noted that confession appeared to play a valuable part as a means of psychotherapy and that many of the priests were trained in human psychology. In Holland, a Lutheran country, where much of the nursing is done by deaconesses, she was also favourably impressed and in both countries, with the notable exception of one institution, she finds much to praise in the hospital conditions. In France, on the other hand, she found both the nursing and the facilities for occupying the patients and developing their individual interests far less satisfactory. It would clearly be unfair to judge of the conditions in any of the three countries from such a brief and limited investigation. It is, however, of interest to observe that Miss Hankin, who has nursed in mental hospitals in England, although not in recent years, notes differences in the attitude adopted to the patients by the nurses, in the provision of suitable occupation, and in the prevalence of red tape. In these respects the foreign hospitals appear to score. In two of the hospitals visited a recovery-rate of 60 per cent. is claimed; whereas in this country this rate is generally considered not to exceed 35 per cent. It would be interesting to know to what extent the figures were based on similar classifications. Miss Hankin was particularly impressed by the colony at Gheel and her regret that we have no parallel in this country is shared by many. She notes also that in certain hospitals where the best results are claimed there is a very high proportion of both nurses and doctors to patients.

[1] Doors of Hope. By Mabel Hankin. London: John Bale, Sons and Danielsson Ltd. 1935. Pp. 59. 2s. 6d

NEW PREPARATIONS

MANDELIC ACID (BOOTS).—We have received from Messrs. Boots Pure Drug Company Limited, Nottingham, a sample of their mandelic acid for use in the treatment of urinary infections. This is a crystalline powder readily soluble in water, alcohol, and ether, has a melting point of 118° to 120° C., and is represented by the formula $CH(OH).COOH$. Two years ago (THE LANCET, 1933, i., 855) Mr. A. T. Fuller, Ph.D., described work performed at the Bernhard Baron Memorial Research Laboratories, Queen Charlotte's Hospital, on the ketogenic diet and the nature of the bactericidal agent concerned. The present use of mandelic acid in the treatment of chronic infections of the urinary tract follows this work of Dr. Fuller and that of Dr. M. L. Rosenheim (THE LANCET, 1935, i., 1032) who found mandelic acid to be a valuable agent in cases of urinary infection unassociated with urinary obstruction. Since Dr. Rosenheim's article appeared Messrs. Boots have received medical evidence from several sources confirming the findings disclosed in Dr. Rosenheim's paper, the urine of the patients being rendered sterile and the improvement in conditions following in a satisfactory manner. It is admitted that for the present the treatment may have to be repeated on occasion, as in some cases it has been found that on discontinuance the urine becomes non-sterile, when the symptoms reappear. The dosage employed has been 12 g. of mandelic acid per day, and the fluid intake should be limited to two pints and the acidity of the urine increased by the administration of ammonium chloride. The standard mixture used in the treatment of cases at University College Hospital contains 3 g. of mandelic acid per ounce just neutralised by sodium bicarbonate and flavoured with lemon. One ounce of this mixture is given four times a day, while 8 cachets, each containing 1 g. of ammonium chloride, are also given during the day. A useful leaflet on the whole subject is supplied by the manufacturers, which includes the warning that careful supervision of the patient is required, lest the drug should act as a renal irritant. The preparation is non-toxic in therapeutic doses.

ERGOMETRINE.—The note published in THE LANCET on August 10th, 1935, p. 353, referring to this preparation is stated to give the impression that Messrs. Allen and Hanburys Ltd. issued ergometrine some time before the drug was issued by British Drug Houses Ltd. British Drug Houses Ltd. recall that on the publication of a paper which appeared in the *British Medical Journal* on March 16th, 1935, Ergometrine B.D.H. was placed upon the market. This fact was announced in a letter published in THE LANCET on April 13th, 1935, from Mr. C. A. Hill, managing director of British Drug Houses Ltd. British Drug Houses Ltd. find that the note under "New Preparations" of August 10th last gives the impression that not only were they not pioneers but were late in the field. In that note Mr. Hill's letter of April 13th ought to have been referred to.

THE MANUFACTURE OF RUBBER BULBS.—The manufacture of rubber bulbs is now meeting with a great variety of needs. In surgical work both thick-necked and thin-necked bulbs are required, for example, in different varieties of ear and nose spray. Nozzles assume different shapes and for convenience some of the bulbs may be made with a flat bottom. The length of the neck may also vary according to needs. We have received from Messrs. David

Moseley and Sons, Ltd., Ardwick, an interesting catalogue of the bulbs which they have on the market, and it may be noted that such a detail as the internal diameter of the neck can be arranged in accordance with requirements.

"THE LOCOMOTIVE GOD."—Miss Clara Leiser, 7, Park-avenue, New York City, writes that she is preparing an authorised biographical and critical study of Prof. William Ellery Leonard and his work. She hopes that psychologists, psychiatrists, or neurologists who have been in communication with him, have met him personally, or have definite opinions concerning his work—"The Locomotive God," published in America in 1927—will assist her and promises to return promptly anything that may be sent to her.

PROSTIGMIN AT REDUCED COST.—Attention has been called in our correspondence columns to the troublesome fact that the present price of this drug places it beyond the reach of the hospital class of patient except for short periods. Messrs. Hoffmann-La Roche inform us that Prostigmin is now available for the treatment of myasthenia cases in a more economical packing. This consists of 5 c.cm. rubber-capped phials of a concentrated solution, each cubic centimetre being equivalent to 2·5 mg. of prostigmin substance. 1 c.cm. of this concentrated solution is therefore equal in potency to 5 ordinary ampoules.

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital for Genito-Urinary Diseases, Austral-street, S.E.—Res. H.S. At rate of £100.
Altrincham General Hospital.—Sen. H.S. At rate of £150.
Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.
Bath Royal United Hospital.—H.S. At rate of £150.
Bedford County Hospital.—First H.S. At rate of £155.
Belfast, Forster Green Hospital for Consumption and Chest Diseases.—H.P. At rate of £150.
Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.
Birmingham, Queen's Hospital.—Asst. Ophth. Surgeon. £50.
Blackburn County Borough.—Asst. M.O.H. £600.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.
Bradford Children's Hospital.—H.S. £100.
Bradford City.—Asst. School M.O. £500.
Brighton, New Sussex Hospital for Women, Windlesham-road.—H.S. £100.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Bristol Eye Hospital.—Jun. Res. H.S. £100.
Bristol, Frenchay Park Children's Orthopædic Hospital and Sanatorium.—Res. M.O. £250.
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350. Also H.S. At rate of £100.
Cheshire, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.
Croydon General Hospital.—H.S. £125.
Croydon, Mayday Hospital.—Res. Asst. M.O. £350.
Derbyshire County Council.—Tuberculosis Officer. £750.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose and Throat Depts. £175.
Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also Res. Anæsthetist. At rate of £175.
Dreadnought Hospital, Greenwich, S.E.—Med. Supt. £250.
Durham County Council.—Asst. Welfare M.O. £500.
Ealing Borough.—Asst. M.O.H. £600.
Enfield U.D.C.—Asst. M.O.H. and Asst. School M.O. £600.
Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Ear, Nose, and Throat Dept. Each at rate of £150.
Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.
Gloucestershire Royal Infirmary.—H.P. At rate of £150.
Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £200.
Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.
Great Yarmouth General Hospital.—H.S. £140.
Guildford, Royal Surrey County Hospital.—Res. Surg. O. £250. Also H.P. and Cas. O. £150.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100.
Hastings, Royal East Sussex Hospital.—Hon. Anæsthetist. Also Locum H.S. £5 5s. per week.
Herefordshire General Hospital.—H.P., also H.S. and Cas. O. Each at rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Research Fellow for Morbid Anatomy. £500. Res. Med. Supt. £300. Asst. M.O. £300. Also Out-patient Med. Reg. £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Huddersfield Royal Infirmary.—Cas. O. £200.
Indian Medical Service.—Commissions.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Kincardine County.—Divisional M.O.H. £500.
King's College Hospital, S.E.—Registrar to Ear, Nose, and Throat Dept.
Leicestershire County Council.—Asst. County M.O.H. £700.
Liverpool County Borough.—Two Jun. Asst. School M.O.'s. Each £500.
Liverpool, County Mental Hospital, Rainhill.—First and Second Asst. M.O.'s. £700 and £650 respectively.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.
Liverpool Stanley Hospital.—H.S. At rate of £100.
L.C.C.—Consulting Dental Surgeon. £1200.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Maidstone, West Kent General Hospital.—Two H.S.'s. Also H.P. Each £150.
Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.
Manchester, Crumpsall Hospital and Institution.—Jun. Res. Asst. M.O. At rate of £200.
Manchester, St. Mary's Hospitals.—Res. Obstet. O. £175. Also two H.S.'s. Each at rate of £50.
Margate and District General Hospital.—Res. M.O. £150.
Middlesbrough, North Riding Infirmary.—Asst. Hon. Surgeon. Also Third H.S. £125.
New Zealand, University of Otago and Dunedin Hospital.—Sen. Res. M.O. £500.
Northampton General Hospital.—Hon. Obstet. Surgeon. H.S. H.S. to Ear, Nose and Throat Dept. Also Cas. O. Each at rate of £150.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.
Norwich, Norfolk and Norwich Hospital.—H.P. £120.
Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £150.
Plymouth Education Committee.—Asst. School M.O. £500.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.
Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.
Princess Louise, Kensington, Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. A rate of £100. Res. Anæsthetist and Dist. Res. M.O. At rate of £90. Asst. Res. M.O. At rate of £80. Also Obstet. Surgeon to Out-patients, and Fourth M.O. to Antenatal Dept.
R.A.M.C.—Commissions.
Reading, Royal Berkshire Hospital.—Res. H.P., Res. Cas. O., also Res. M.O. for Blagrave Branch Hospital. Each at rate of £125.
Rotherham Hospital.—Cas. H.S. £150.
Royal National Orthopædic Hospital, 61, Portland-street, W.—Two H.S.'s (one for Country Branch). Each at rate of £150.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
St. Leonards-on-Sea, Buchanan Hospital.—Hon. Anæsthetist.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.
St. Thomas's Hospital, S.E.—Surgeon. Also Surgeon to Out-patients.
Salford Royal Hospital.—H.P., two H.S.'s. Also Cas. H.S. Each at rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Asst. Cas. O. At rate of £120 and £80 respectively.
Sheffield Royal Infirmary.—Second Asst. Cas. O. At rate of £80.
Sidcup, Queen Mary's Hospital.—Asst. M.O. £350.
Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.
Southampton, Royal South Hants and Southampton Hospital.—Hon. Dermatologist.
Sunderland Children's Hospital.—H.P. £120.
Swanley, Kent, Alexandra Hospital for Children.—Res. Asst. M.O. At rate of £200.
University College Hospital, Gower-street, W.C.—Tuberculosis Officer. £300.
Wakefield, Menston Mental Hospital.—Fifth Asst. M.O. £350.
Warrington Infirmary and Dispensary.—Third Resident. At rate of £150.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Surgeon.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—"Wander" Scholar. £250.
Wigan, Royal Albert Edward Infirmary.—H.S. At rate of £150.
Willesden General Hospital, Harlesden-road, N.W.—Res. Officer. At rate of £100. Also Asst. Surg. O. £50.
Wokingham, Berks, Pinewood Sanatorium.—Asst. M.O. £500.
Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Res. M.O. £175.
York Dispensary.—Res. M.O. £175.
Zetland County Council.—M.O. and Public Vaccinator. £80.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Sunderland (Durham) (latest date for receipt of applications Sept. 10th) and at Markinch (Fife) (applications before Sept. 17th).